DECEMBER 1, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Steel Stocks Ride Uptrend

Look for them to hit 14 million tons by yearend, then climb 5 million tons in first half of '59 . . . Page 37

Why Vacuum Melting Gains

Developments in prices, supply, quality, ingot size, alloys, and uses may benefit you . . . Page 103

Spring Wire Gets Lift

Cross extrusion extends life. Technique may be useful for many specialty items . . . Page 70

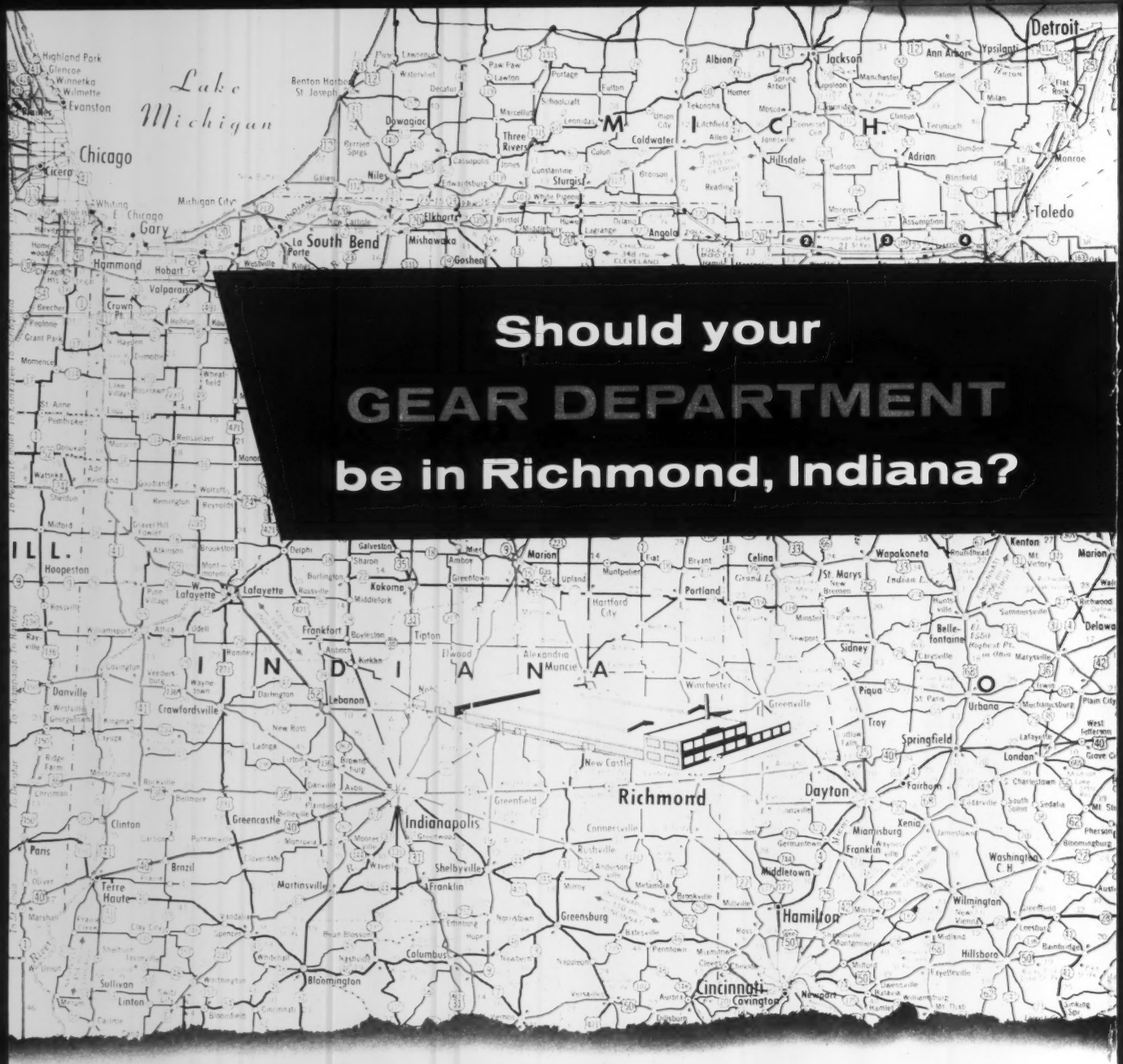
Upgrading Decisions

The breakeven point concept can make you a better manager . . . Page 40

Steelmaking Advances

Gaseous ore reduction offers specialty producers way to integrate . . . Page 78

CONTENTS — PAGE 5



Should your GEAR DEPARTMENT be in Richmond, Indiana?

Today, that's a better question than ever. The current completion of 65% additional square feet of production capacity further improves our position to serve as your *gear department.*

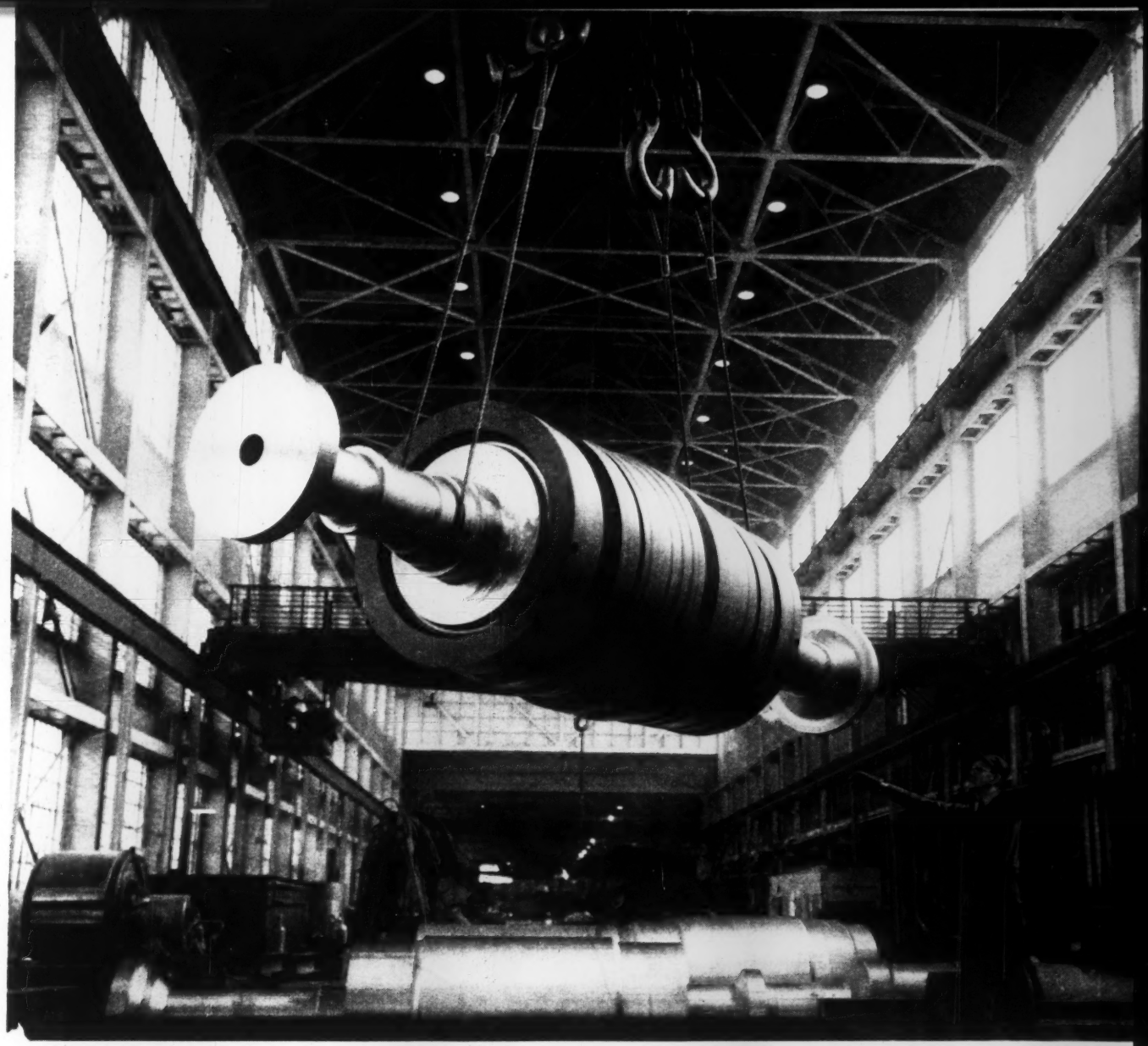
Many of our best customers use us in this manner with all of our facilities geared to their gear needs. Would you like to learn how successful these associations have been, and what a similar service might mean in terms of reduced costs and better gears?

If so, write. The man who responds to your inquiry will be a gear engineer.

EATON

AUTOMOTIVE GEAR DIVISION
MANUFACTURING COMPANY
RICHMOND, INDIANA

GEARS FOR AUTOMOTIVE, FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS
GEAR-MAKERS TO LEADING MANUFACTURERS



Its Job is to Help Produce Power

As the public utilities race to keep up with demands for more and more power, forgings like this become increasingly important. The one you see here is a steam-turbine spindle, and it will soon be doing its part in the large-scale production of kilowatts.

Bethlehem press-forged the spindle from an alloy-steel ingot containing molybdenum, chromium, nickel, and vanadium. Then the Bethlehem machine shops took over and worked carefully to exacting specifications. When ready for shipment, the spindle weighed 28 tons; was 18 ft 6 in. long.

This is just one of the many types of forgings that Bethlehem makes each year. Our shops are equipped to produce the largest, the smallest, and everything in between. Whether you need tiny drop forgings or huge shafts weighing a hundred tons, we can make and machine them for you. Call us and draw upon our half-century of experience.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Take a new look at

ZIRCONIUM

Now zirconium takes another giant step ... from an expensive rarity to a readily available special-purpose metal. Capacity is now on hand for not only A.E.C. requirements but also commercial markets. And, as in titanium, Mallory-Sharon is in the forefront of this rapid development.

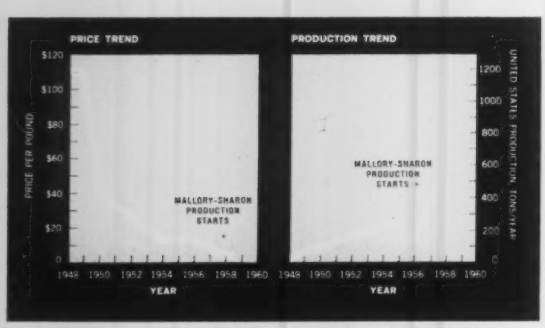
A modern, highly efficient zirconium and titanium sponge plant at Ashtabula, Ohio, now makes Mallory-Sharon the largest single source of metallic zirconium, and its by-product, hafnium.

Mallory-Sharon's integrated production facilities ... from raw materials through finished mill products ... mean *greater availability* and *lower costs*.

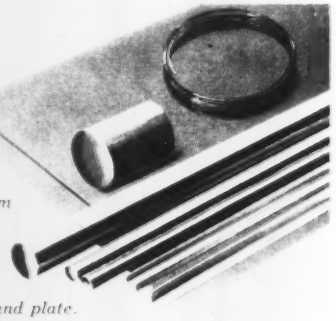
We're ready *now* to help you explore practical commercial uses for zirconium. Write us for technical information, or engineering assistance on specific applications.

For technical facts — *Write for new 16-page booklet, giving technical and application data on zirconium ... its excellent corrosion resistance to most acids, alkalies and combinations of these media ... its remarkable nuclear properties.*

For availability — *As Mallory-Sharon's large, modern, sponge plant reaches full production this year, zirconium becomes readily available for all commercial applications.*



For lower prices — *Greater availability will definitely be reflected in lower prices. In many cases, the improved performance of zirconium parts much more than offsets their higher material cost.*

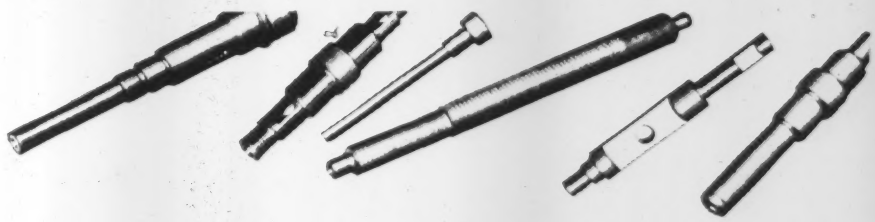


For mill products — *Zirconium is now available from Mallory-Sharon in the form of rounds, bars and billets, wire, tubing, strip, foil, sheet and plate. Quality and properties are carefully controlled at every stage of production.*

MALLORY SHARON

MALLORY-SHARON METALS CORPORATION · NILES, OHIO

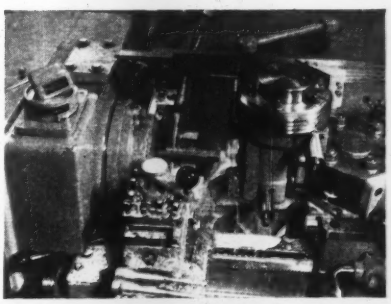
Integrated producer of Titanium • Zirconium • Special Metals



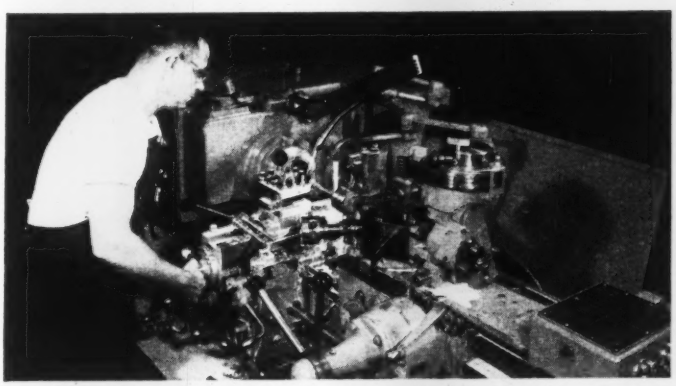
Small-lot production of step shafts more than triples

...when Warner & Swasey No. 3 Electro-Cycle,® with Versatile Step Turner, Handles the Job at Hobart Brothers Co., Troy, Ohio

Also, their Electro-Cycle's flexibility and ease of job changeover permit the handling of a wide variety of less complex work in lots of 5 to 50 pieces. As many as 17 jobs have been completed during a 9-hour shift!



On this versatile Step Turner attachment—once the initial cutter setting has been established—two to four different diameters can be easily selected by simply turning the micrometer dials to desired diameters. If needed, a fifth diameter may be obtained by using the stop screw located at the lower rack's end. Step Turners are available with diameter capacities 1/8" to 1 1/2", shoulder lengths variable as required, with a total length limitation of 10 inches.



This Electro-Cycle Turret Lathe, shown operating at Hobart Brothers Co., is used for both long and short run production. Automatic, electrical control of all spindle functions greatly reduces machine handling time. They handle a wide variety of jobs in materials from copper and brass up to the toughest alloy steels used today.

Hobart Brothers Co., one of the world's largest manufacturers of electric arc welding equipment, relies on their new Electro-Cycle Turret Lathe to machine a majority of the smaller turned components in their motor generator sets.

The Electro-Cycle's Step Turner attachment enables the automatic turning of five separate diameters in a single setup. The part being machined is completed by using only five stations on the hexagon turret—end stop, center bar end, center support, step turn and then thread. Necking for grinding and thread relief is easily handled from the square turret.

As all shafts are subsequently ground, Hobart holds their machining tolerances to +.005"—.000". These tolerances are easily handled by the versatile Step Turner attachment.

An AISI 4140 steel governor shaft was formerly produced at the rate of 2 to 3 pieces hourly—now one is finished each 4 to 5 minutes. As their shafts are produced from standard mill lengths of bar stock, the Electro-Cycle's Power Bar Feed and Collet Chuck have proved to be a great fatigue-saver to the operator.

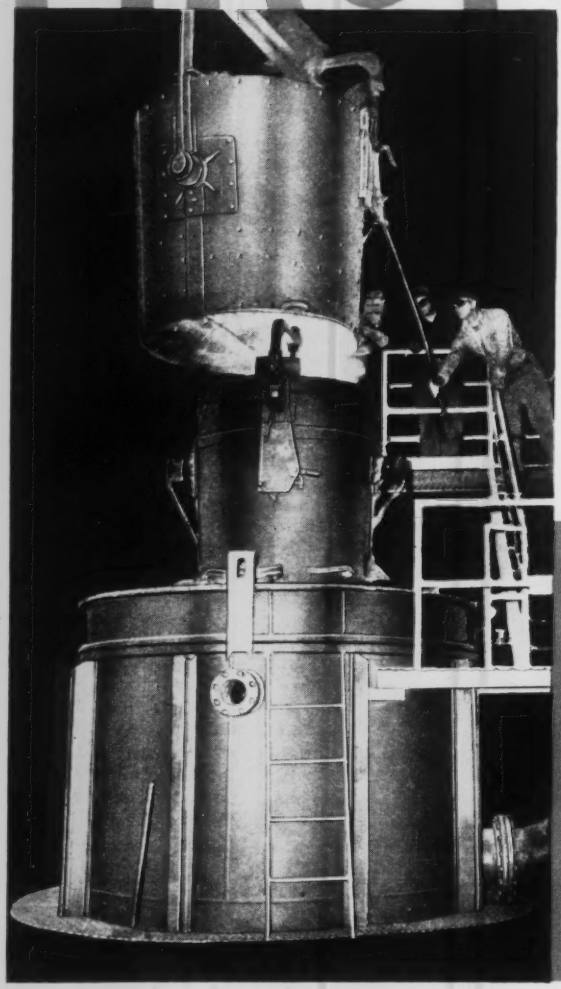
Contact your nearest Warner & Swasey Field Representative to get the complete story on how Electro-Cycles can radically improve your production—and profit picture, too. He's as near as your telephone, so call today.

® Reg. U. S. Pat. Off.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

FIRST with VACUUM DEGASSING in die casting die steels THERMOLD AV



For your most exacting die casting jobs, Thermold AV gives you the assurance of highest quality by the use of the ultimate in melting technique—vacuum degassing.

Now large size ingots are vacuum degassed in standard production processing—the first tool steel degassing installation in the United States.

This new advantage is in addition to quality controls that have set the standard for the industry—small batch furnace melting, close control of press forging and annealing, and 100% Reflectoscope testing.

With this contribution to the high quality of Thermold AV, Universal-Cyclops gives further assurance of homogeneity of structure, freedom from gaseous impurities, high polishing quality and the utmost resistance to thermal and mechanical fatigue.

Write for new bulletin.

A heat of Thermold AV being processed in the vacuum degassing installation.

A block of Thermold AV measuring 18" x 36"x 48". One of the largest forged blocks of high alloy die casting die steel ever produced—typical of sizes available vacuum degassed.

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STEEL CORPORATION
BRIDGEVILLE, PA.

TOOL STEELS • STAINLESS STEELS • HIGH TEMPERATURE METALS

FOR YOUR NEXT CRITICAL DIE CASTING JOB, GET IN TOUCH WITH YOUR NEAREST UNIVERSAL-CYCLOPS SALES OFFICE OR WAREHOUSE.

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This Week in STEEL The Metalworking Weekly

December 1, 1958
Vol. 143 No. 22

EDITORIAL 35

Depreciation is industry's No. 1 tax problem, experts agree, but they can't agree on what they want.

SPECIAL FEATURE 103

Why Vacuum Melting Gains

A large number of developments have taken place in such metals in the last year or two. You should take a look now and again six months from now. They may help save you money or improve your product.

WINDOWS OF WASHINGTON 44

Statement by Strauss points up plight of shipbuilders, who will appeal to Congress for increased subsidies.

MIRRORS OF MOTORDOM 52

Chevrolet assigns two engineers to squeak and rattle patrol. It's part of program to keep buyers happy.

THE BUSINESS TREND 55

STEEL's industrial production index hits 15-month high. Most metalworking barometers show monthly gains.

WHERE TO FIND—

Behind the Scenes 6
Letters to the Editors 10
Editorial & Business Staffs .. 16
Calendar of Meetings 29
Men of Industry 59
New Products 89
New Literature 98
Advertising Index 133

Business— METALWORKING OUTLOOK 31

- Steel Inventory Trend Line to Climb Steadily in '59 37
- U. S. Wire Mills Want Help in Competing with Imports 38
- Bethlehem-Youngstown Merger: What Will Supreme Court Do? 39
- Breakeven Point: Route to Better Decision Making 40
- Plastics Buck the Recession—Many used in metalworking 41
- Lack of Unity May Stall Foes of Renegotiation 42
- Metal Furniture Men Hopeful—Shipments expected to improve 47
- Purchasing Directors Keep the Machines Running 48
- Republic Plans New Plate Mill at Gadsden, Ala. 66

Production— TECHNICAL OUTLOOK 69

- Spring Wire Gets a Lift—Cross extrusion increases life 70
- Direct Labor Costs Cropped by Integrated Cupola Charging .. 72
- Casting Tears Slashed—Welding time cut from 50 hours to 1 ... 74
- Plastic Masking Aids Platers—Dries fast, easy to remove 75
- Automaker Welds at 150 ipm—Hollow electrode holds flux ... 76
- Progress in Steelmaking—Direct Reduction for Small Plants 78
- Modified Cleating Tool Trims Cost—Old, new ways compared 82
- Storage Tiered, Mechanized—System has pushbutton control.. 84
- Aluminum Rivets Upgrade Parts Made of Aluminum 86

Markets— MARKET OUTLOOK 101

- Complete Index to Market News and Prices 101
- Vacuum Melting Gains—Developments come fast 103
- Steelworks Operation Chart and District Ingot Rates 110
- Scrap Index Is Still Slipping 125
- Nonferrous Metals—Copper Use Parallels Sales 128

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How to
drive
it with
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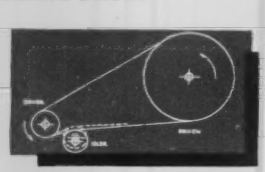
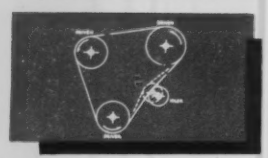
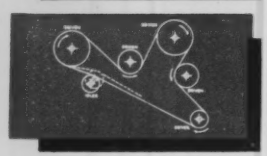
chain
and
sprockets

Acme Precision Roller Chains and Sprockets are easily adaptable for most any drive where maximum efficiency is essential, a few of which are illustrated below.







Acme Chains and Sprockets deliver Positive — Efficient — Economical — Flexible — Rugged — and Quiet Power Transmission. For the solution of your power transmission problems, send them to Acme.

Write Dept. 10-D for new illustrated 100 page catalog which includes new engineering section showing 36 methods of chain driving.

Acme Chain Corporation
HOLYOKE
MASSACHUSETTS

behind the scenes

Process Improves with Age

Everybody knows that, until the boys who are juggling atoms can cook up synthetic batches of the metal, iron is one of the expendable treasures of the earth. In theory, when all the iron ore is used up, no more of the stuff will grow. Folks in the iron business are aware of this, and they are making long range plans that take into consideration the state of the ferrous world a century from now.

In the history of the earth, men and iron have been associated no longer than a wink of time, and it is sobering to think that the wink is almost completed. However, the thought that engages our attention is the curious fact that, in the sunset of its siderological progress, iron is again being separated from its ores the same way it was when man first experimented with the metal: By direct reduction, with sponge iron as an immediate result.

True, these terms are used somewhat loosely, but they serve to picture the process. Well, on Page 78 this week, STEEL shows how modern, direct reduction of ore in making sponge iron has opened the door to economical production of steel in many world areas unable to establish steel industries. Iron ore formed about 5 per cent of the earth's crust before a lot of it was used up in wars and industrial expansion, but in the old days (before this article went to press) steelmakers were obliged to resort to blast furnaces, which cost a pretty penny in any currency. Officials of Fierro Esponja S. A., Monterrey, Mex., an affiliate of Hojalata y Lamina S. A., one of Mexico's principal steel producers, invited M. W. Kellogg Co., New York, a subsidiary of Pullman Inc., to huddle with them over the idea of making iron without blast furnaces.

The Kellogg people came through in fine style, and we're glad that they did, because the entire operation makes a fine story for our technical section.

Steel Shoe Shanks

While we're on the subject of iron, it would be consistent to introduce the American Iron & Steel Institute, and permit that learned and metallurgically erudite organization to contribute an addenda. Guided by this charitable thought, we fished through some of its recent press releases, but failed to progress beyond an item on stiletto heels.

"Stiletto heels," said the AISI, "have made many people aware of an old use of steel—its use in shoes. Those high, slender heels on ladies' dress shoes are made practical as well as stylish by cores of steel. The core resembles a fluted nail or spike, rising to a top lift. It is inserted into a plastic heel block under pressure. The shanks are made from cold rolled steel strip . . ." and with those words we stopped reading, because a phrase popped out of nowhere and possessed us: Steel shoe shanks.

It whirled about madly and tenaciously, like the terrible rhyme that nearly drove Mark Twain crazy. Remember? It was about conductors exhorting themselves to punch tickets in the presence of the passenger, and it went like this:

Punch, brothers, punch.
Punch with care—
Punch in the presence
Of the pass-en-jare—

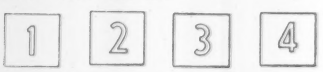
Unfortunately, "steel shoe shanks" is almost as enervating as "punch, brothers, punch." The only way to get rid of it is to make it into a rhyme, and pass it on:

Walk, baby, walk
On steel shoe shanks.
Walk without clinking,
But just dig them clanks!

Silver Moon Can't Rust

In the area of constructive knowledge, we feel urged to quote from the Rust-Oleum Corp., an organization which recently developed a Rust Index of the United States. (STEEL, Sept. 1, p. 37.) The Evanston, Ill., rust fighting company reveals a big geographical variance in this country's corrosion rate. Depending on where in the U. S. it was exposed, a panel about the size and weight of an auto license plate would rust in three to 15 years. For instance, it would rust quicker in Boston than in Yuma, Ariz. But on the moon, says Rust-Oleum brightly, it wouldn't rust at all. That is because the moon has no moisture, no wind, nor free oxygen. So, if you ever drive to the moon, you need never worry about your license plates growing rusty.

Name the Cards



Here are four playing cards. The jack is nearer to the queen than the king is to the jack. The jack is nearer to the ace than the queen is to the jack. The spade is nearer to the club than the diamond to the spade. The spade is nearer to the heart than the club is to the spade. The heart is just to the left of the king. Name all four cards.

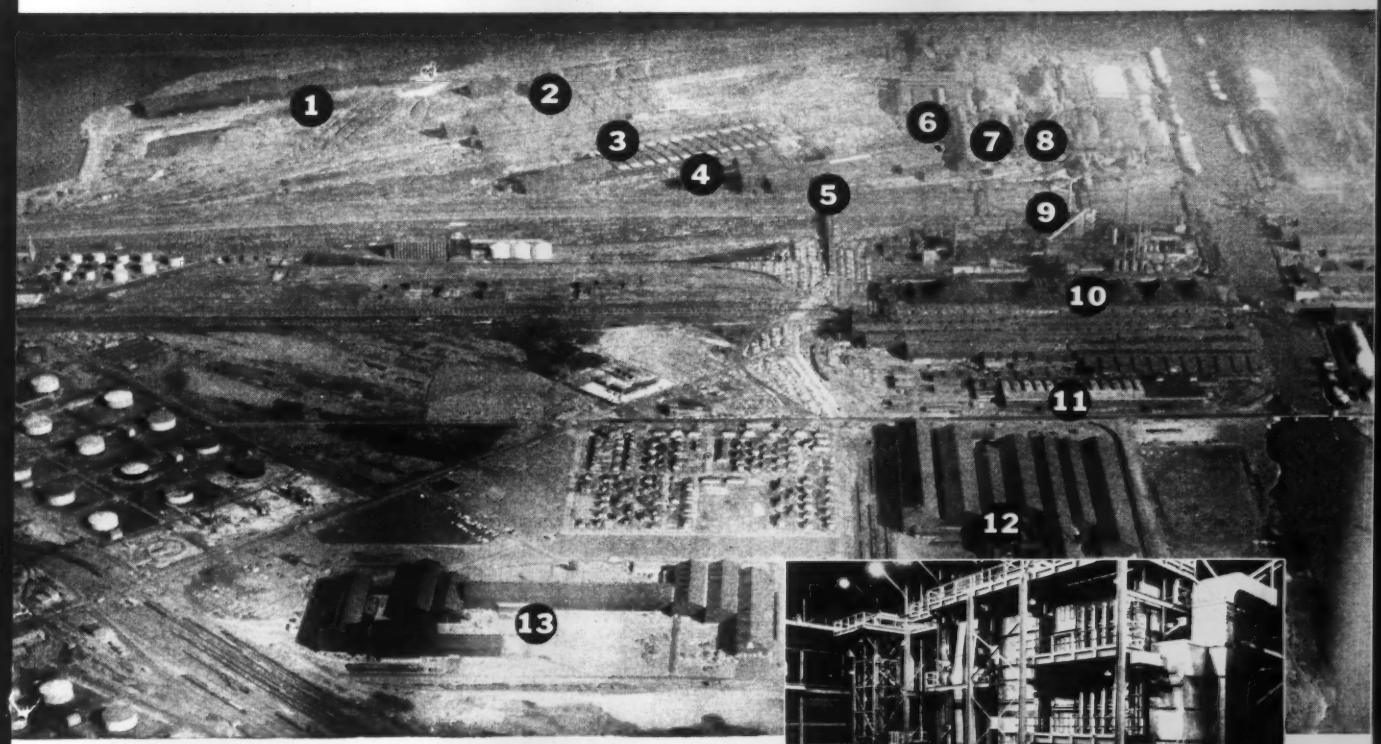
Shrdlu

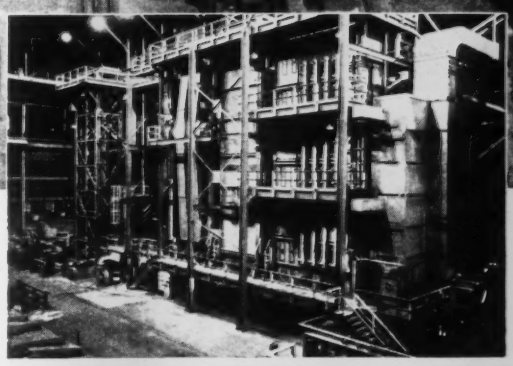
(Metalworking Outlook—Page 31)

Birdseye view of the future...

Youngstown's Expansion Program provides more quality steel for Mid-America

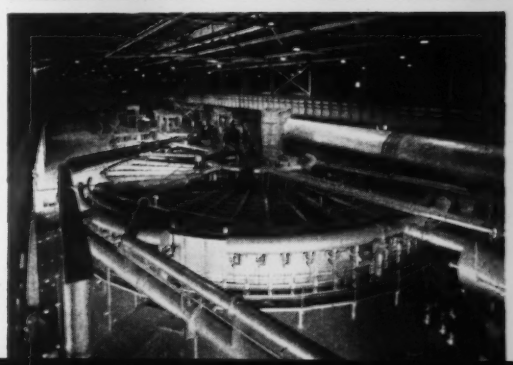
The hustle, the feel of the future and the booming spirit of expansion . . . this is the spirit of Youngstown. The birdseye view shows our Indiana Harbor facilities where we are putting this spirit to work in the Chicago area. In addition to our No. 2 Blooming Mill (2), No. 2 Open Hearth Shop (3), Merchant Mill (4), No. 1 Open Hearth Shop (5), Billet and Skelp Mill (6), Continuous Weld Pipe Mills (7), Blast Furnaces (8), Coke Plant (10), Strip and No. 1 Tin Mills (11), the Cold Reduced Sheet Mill (12) . . . our new No. 3 Seamless Tube Mill (1), our new (9) Sintering Plant (construction began in March 1958) and our new No. 2 Tin Mill (13) are shown. These last three expansions are pointed directly at the growing markets of the Mid-Continent. Like the pioneers who made America the great nation it is, Youngstown moves toward new horizons . . . new ways to supply your steel needs through quality products and friendly, efficient service!





Huge new Continuous Annealing Line in our No. 2 Tin Plate Mill, Indiana Harbor Plant.

The world's largest Rotary Billet-Heating Furnace in our No. 3 Seamless Tube Mill, Indiana Harbor Plant.



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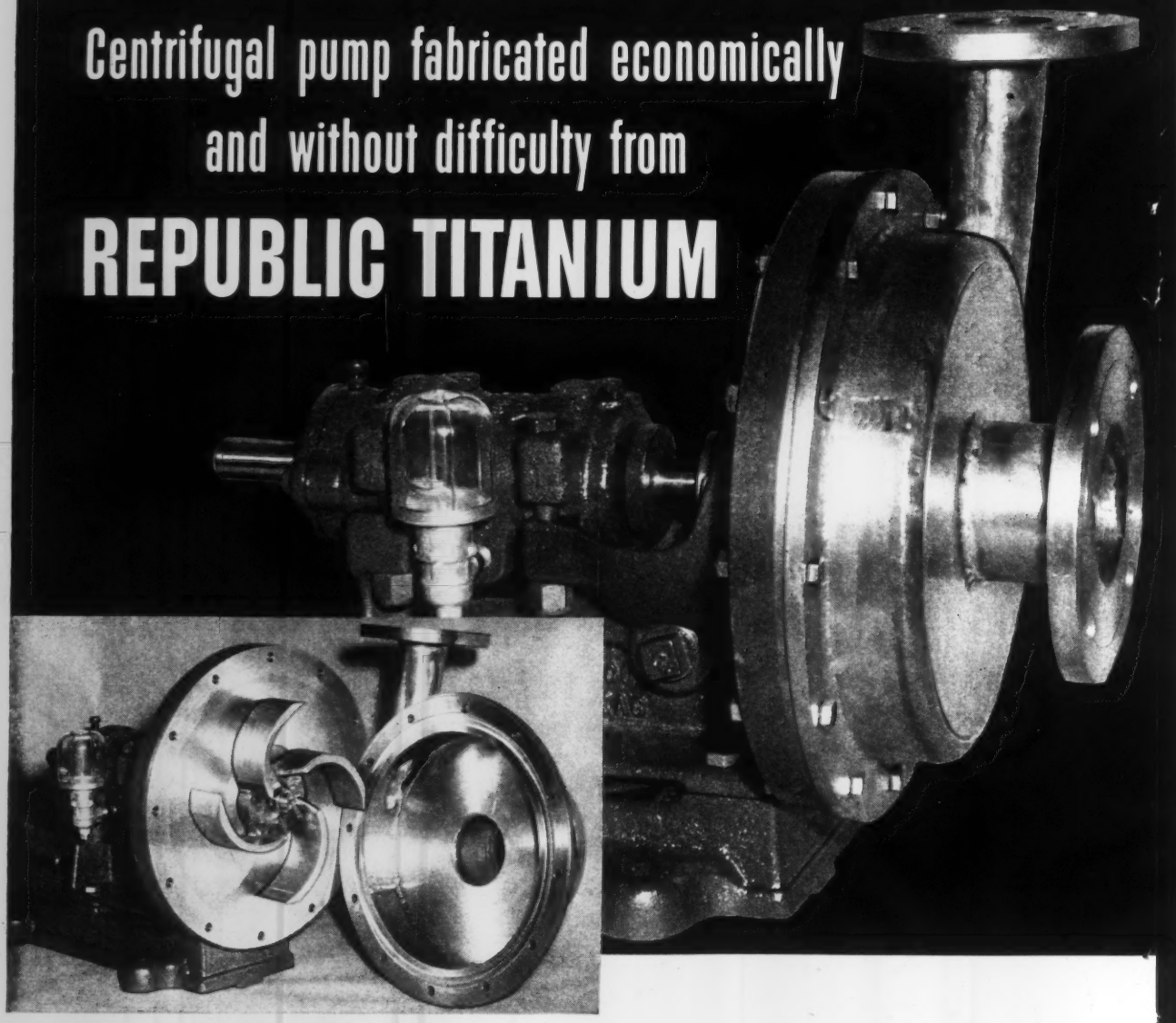
THE
YOUNGSTOWN
SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

PLANTS AT YOUNGSTOWN, OHIO AND INDIANA HARBOR, INDIANA

Centrifugal pump fabricated economically and without difficulty from REPUBLIC TITANIUM



Mission Manufacturing Company, Houston, Texas, has added a worthy companion to its full line of centrifugal pumps for corrosive and abrasive applications. Shielded-arc welding techniques now permit the use of titanium in its maximum corrosion-resistant form for particularly severe pumping applications.

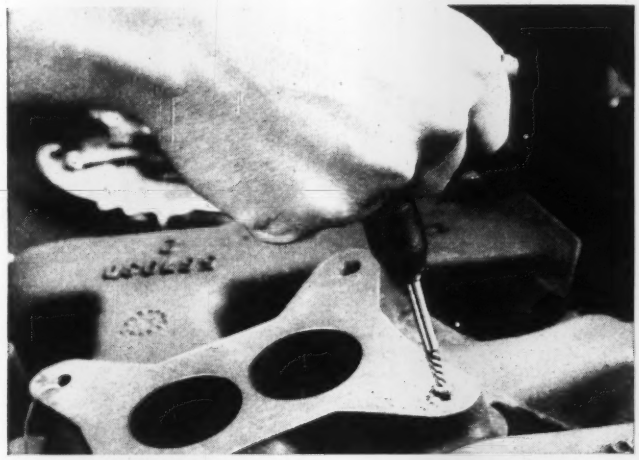
The pump shown above was fabricated by shaping, welding in an inert gas atmosphere, and machining. It is being used by a leading chemical company to handle ferric chloride at temperatures of about 212°F. The finished pump, incorporating the exclusive Mission Concentric Casing, contains 34 pounds of Republic Titanium.

Performance ratings are essentially similar to those obtained for cast iron or corrosion-resistant alloys. Fewer pump sizes are required because the flat characteristics of Mission's impeller design provide a wide operating range and sustained efficiencies.

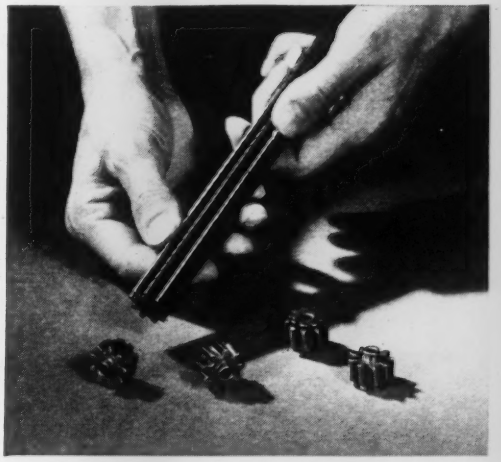
The entire fabricating operation was performed without difficulty and with little change in procedure as compared to other materials of construction.

Does this application of Republic Titanium spark an idea for your product that needs to be strong, lightweight, and corrosion-resistant? Republic Metallurgists and Machining Specialists will help you apply titanium's advantages now.

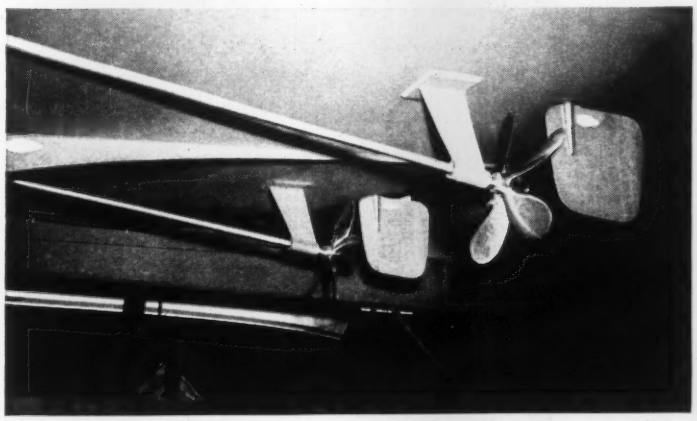
Republic produces commercially pure titanium and titanium alloys in ingots, billets, hot rolled and cold finished bars, plates, sheets, and strip. Mail the coupon for more information on these titanium forms, or for metallurgical and machining assistance.



SAVINGS IN MACHINING AND PRODUCTION COSTS of Ace Screw Extractors are obtained by the Henry L. Hanson Company with the help of Republic Cold Drawn Leaded Alloy Steels. Rolling of the extractor spirals formerly required several passes, each followed by an annealing operation. Now, with Republic Leaded Alloy, separate passes can be made deeper, reducing the total number of steps. And, because cold drawing improves the machinability of any given analysis, savings in machining costs are secured. Republic Alloys, Types 4140 and 4150, also provide a high degree of hardness and toughness. These properties in combination with scientific heat treating make the extractors practically unbreakable. Get all the facts on the advantages of Republic Cold Finished Alloy Steels. Mail the coupon today.



LOWER COSTS, IMPROVE QUALITY, INCREASE PRODUCTION with Republic Cold Drawn Special Sections. Because they are formed to the predominating cross-section of the part, Republic Special Sections eliminate or greatly reduce required machining. Results are faster output and lower cost. Also, since cold drawing improves the physical properties of any given analysis, completed parts are stronger and longer wearing. Other advantages may include improved appearance and simplified design. Send coupon for complete facts.



IMPROVED PRODUCT PERFORMANCE is reported by Roamer Steel Boats, Division of Chris-Craft Corporation, since switching to Republic Cold Finished Stainless Steel Bars. Vibration, a mechanical problem caused by out-of-true drive shafts, has been reduced to a minimum by Roamer through standardization of stainless shafts for their line of pleasure cruisers. The shafts are machined from uniformly straight Republic Cold Finished Stainless Steel Bars, Type 304. The bars meet Roamer's strict, maximum tolerance requirement of .006″ runout in 72″ of shafting. Stainless steel shafts also provide high strength and outstanding corrosion resistance. Republic specialists will help you use Cold Finished Stainless Steel Bars to best advantage. Mail coupon for more information.

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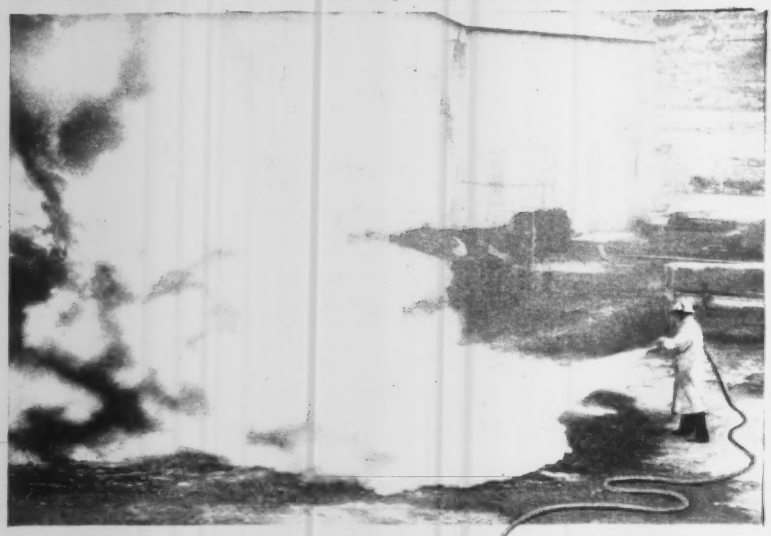
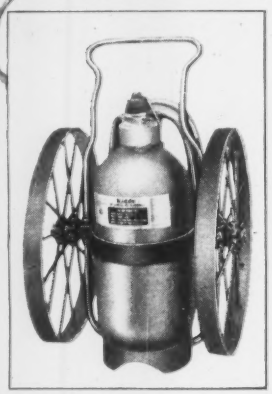
NEW! FOR FIGHTING LIQUID FIRES!



ONE-MAN DRY CHEMICAL KILLS MORE FIRE FASTER!

This new Kidde 200-pound pressurized unit has an *extra* 50 pounds of fire-smothering dry chemical, is designed for faster, easier operation. Its 40-foot stream gives more efficient extinguishing action, greater heat protection for the operator! No valves to unscrew, no wait for pressure, no pressure reducer to cause you trouble. Just remove safety pin, flip valve toggle, turn on nozzle lever. No conventional seal. Its exclusive Bridgeman seal holds pressure by using 450 psi to exert a *three-ton* sealing force.



COMPLETELY NEW DRY CHEMICAL LINE GIVES FASTER, EASIER OPERATION!

On the left, the new Kidde 20-pound dry chemical portable — completely new, completely better. The simplest, most efficient dry chemical portable on the market. Features include oversize aluminum handle for gloved-hand operation, perfect balance for faster action, simple one-two operation. Remove horn, pull trigger, and fire's out. Rugged, dustproof pressure gauge is recessed for protection. 10, 20- and 30-pound Kidde portables pressurized at 225-250 psi. Coming soon — new 2½- and 5-lb. models charged at 140-160 psi. Write today for information about this new Kidde line!

Kidde

Walter Kidde & Company, Inc.
1260 Main St., Belleville 9, N.J.
Walter Kidde & Company of Canada Ltd.
Montreal — Toronto — Vancouver

LETTERS TO THE EDITORS

Series Helps Realize Problems

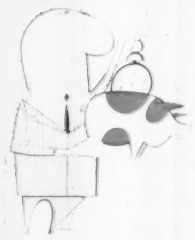
Your series of management articles impressed me as the best I have seen in business magazines. They are just what you have titled them, Management Series!

They have certainly helped me in realizing problems encountered by other departments.

I have been clipping these articles out of the issues. However, several of the issues I have been fortunate enough to get have been loaned to associates. Consequently, I have lost track of them. Will you supply me with a copy of each in the 1958 series?

Alan R. Hanson
Administrative Assistant
Continental Machines Inc.
Savage, Minn.

Saving Time Interests Readers



"How To Save Time" (Nov. 10, p. 86), was so interesting that Prof. Norm Allhiser, who manages industrial training courses at the University of Wisconsin, and who is in charge of Allen-Bradley Co.'s administrative training program, asked me to obtain 75 copies of this article. He would like to use it as part of our training program.

A. Domino
Assistant Purchasing Agent
Allen-Bradley Co.
Milwaukee

• • •

Your article was quite clear and concise. While not entirely new, the suggestions presented by the author have the fresh, hard-hitting approach not common to many business magazines. The conceptual approach was of special interest.

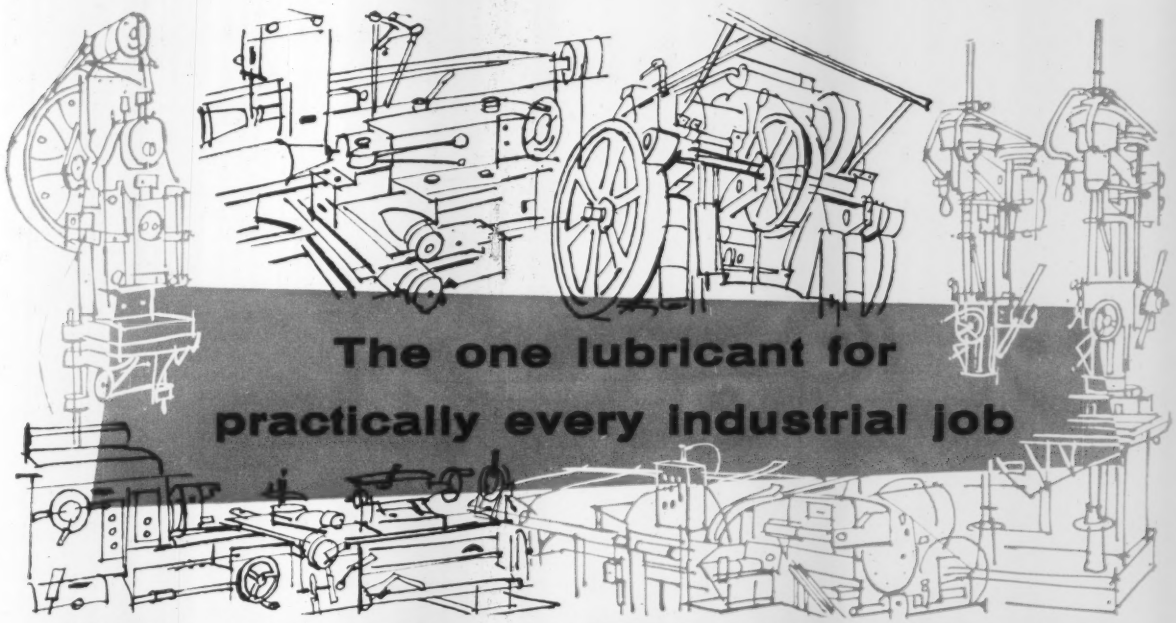
W. A. Orlof
Sales
Hanna Engineering Works
Chicago

Calls Attention to Houston

In "Memo to Steelmen: Imports Rising" (Oct. 27, p. 35), we believe you compound a common error.

You report "more steel entered through

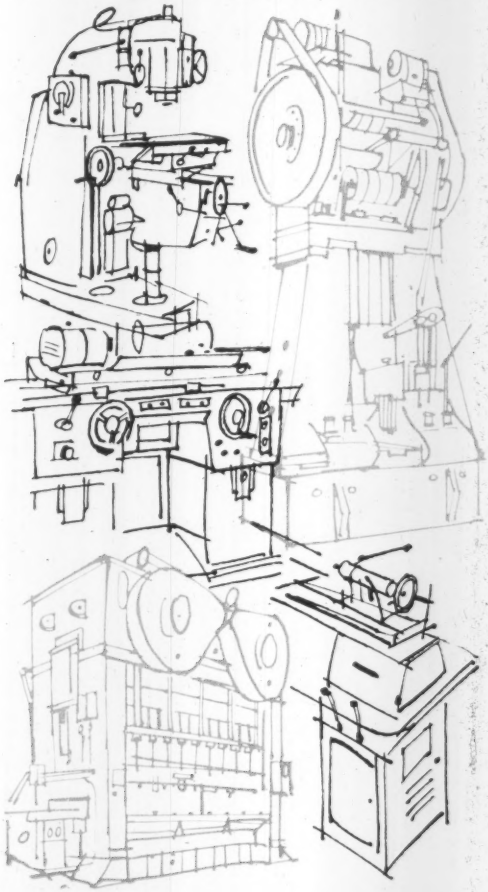
(Please turn to Page 12)



The one lubricant for practically every industrial job

ATLANTIC LUBRICANT 54

Performs on all types of grease-lubricated machinery • Cuts cost • Reduces lubricating errors



Atlantic Lubricant 54—an outstanding multi-purpose lubricant—assures:

- **Wider application**—almost universal application to grease-lubricated equipment in plants of all sizes
- **Excellent performance** at very high to extremely low operating temperatures
- **Reduced losses** from lubricating error
- **Lower costs** of warehousing and handling
- **Outstanding rust protection** for all ferrous surfaces
- **Unusual stability** against oxidation and softening—even under very rugged conditions
- **Easy, positive identification**—thanks to Atlantic Lubricant 54's distinctive purple color

Available from conveniently located warehouses. Call any of the Atlantic offices listed below.

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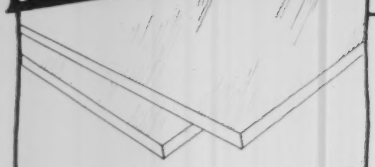
from your Whitehead Metals "Supermarkets"



TOOL AND JIG PLATES

Of Alcoa Aluminum, they are stress relieved, non-porous, corrosion-resistant, easily machined. Available in standard size (48" X 96") in 13 thicknesses; or cut to your specifications. Folder available.

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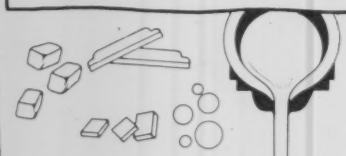
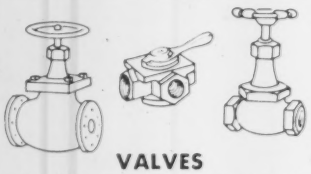
One-stop service for all you need in Aluminum, Copper Alloys, Nickel Alloys and all major types of welding rod and wire. A full line of soft solders and silver brazing alloys, too. Technical service and complete literature on request.



FOUNDRY ALLOYS

Over 100 different types—largest selection in the industry—available in handfuls or carloads off-the-shelf. Technical service, too. Write for "Foundry Alloy" Bulletin FA1.



VALVES

All major types are available from stock in Aluminum, Inconel, Monel, Nickel and Stainless Steel (and plastics, too). Write for descriptive literature.

ARCHITECTURAL SHAPES

Copings, gravel stops and door saddles are just a few of more than two hundred Alcoa aluminum shapes available off the shelf, and illustrated in booklet titled "Shapes." Monel, Stainless and Copper roofing items complete the Whitehead line of architectural materials on hand.

These "Plus Items" and many more are available in addition to a wide selection of corrosion-resistant sheet, rod and tube.

All told, there are more than 20,000 items distributed and serviced by Whitehead. All are available, off-the-shelf, from the nine Whitehead Metal "Supermarkets." All are the products of such leading producers as Alcoa, Anaconda, Inco & Crucible Steel to name just a few.

When you call Whitehead you get fast service, and frank, unbiased help in selection. Technical service when you need it. Add it up and you'll find it pays to

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LETTERS

(Concluded from Page 10)

Galveston, Tex., than through any other American port." We believe that a slight investigation would show you that the bulk of this steel actually entered through the Port of Houston. U. S. Customs headquarters are in Galveston, and Houston tonnage is reported as part of the Galveston Customs District, hence this misconception.

We are not anxious to invite more competition to Houston, but our pride in the Port of Houston as "First in the Gulf, Third in the Nation" forces us to call this matter to your attention.

Robert Carpenter
Vice President
R. P. Oldham Co.
Houston

• *You are so right. Our article should have said Galveston Custom District rather than the Port of Galveston.*

Problem Not Alarming—Yet

May I have 25 copies of "Memo to Steelmen: Imports Rising" (Oct. 27, p. 35), to pass out to our Roll Shop Department. Most of our people are unaware of this condition, and I'm sure that they would like to know more about it.

The problem has probably not reached the alarming state as yet; however, it is clear that the next generation will be faced with sweeping out idle plants and factories.

Thank you for this timely article.

R. S. Westerlund
General Foreman-Roll Shop
Columbia-Geneva Steel Co.
Geneva, Utah

Reader Questions Moly Content

Is it true that Type 316 stainless steel has no molybdenum in its composition as stated in "New Stainless Named D319" (Nov. 10, p. 134)?

C. R. Lind
Vice President
Andale Co.
Lansdale, Pa.

• *Your question is a good one. Type 316 contains 2 to 3 per cent molybdenum.*

Cost Crisis Article Scores

We have read with interest, "How We Beat the Cost Crisis—Two Machines Save $14,766 a Year" (Oct. 6, p. 75). May we have 25 additional copies?

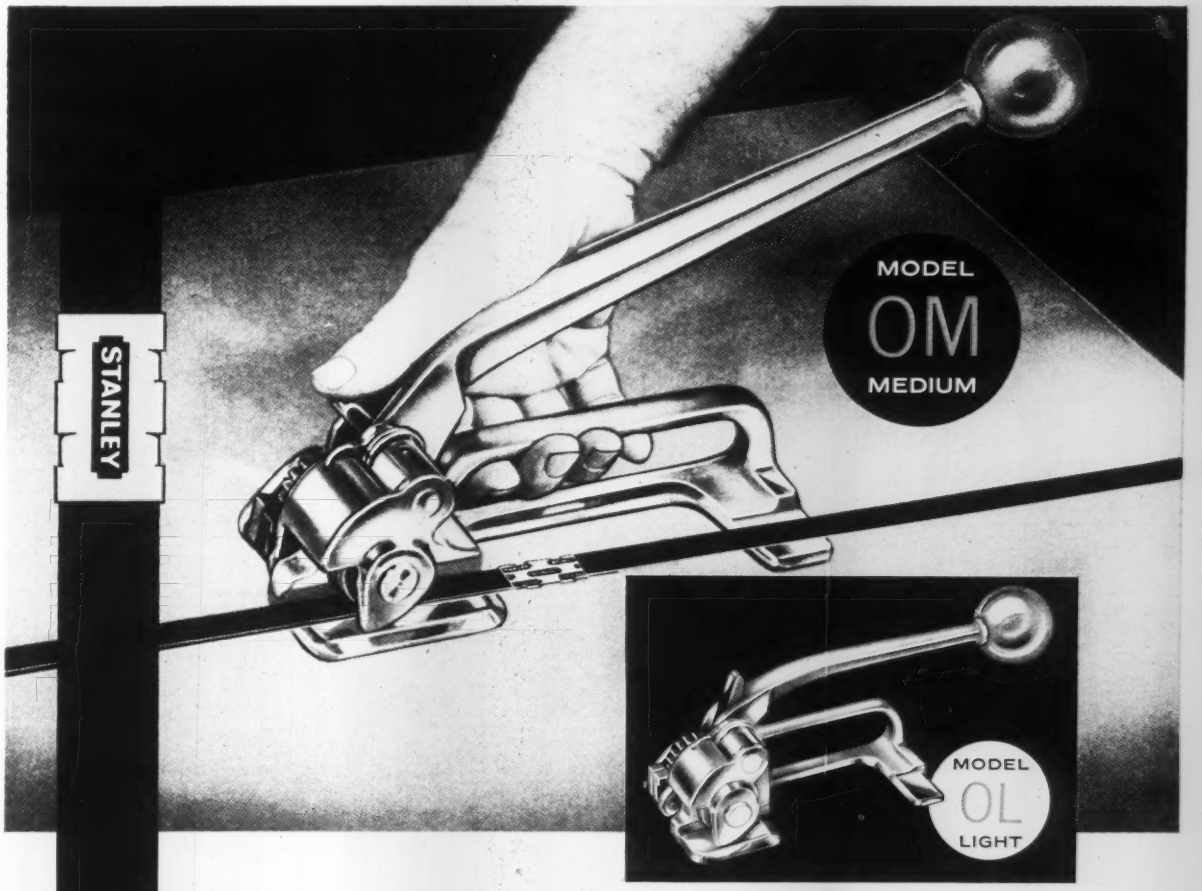
Irving M. Akins
Advertising Manager
Waterbury Farrel Foundry & Machine Co.
Waterbury, Conn.

Help for Heat Treaters

Please send three copies of "Dew Point Monitoring Pays Off" (Oct. 13, p. 100).

This article is of great interest to me. I want the additional copies for our heat treating departments.

D. J. Asquith
Chief Metallurgist
Moore Drop Forging Co.
Springfield, Mass.



NEW STANLEY TIGHTENERS

Versatile . . . Lightweight . . . Sturdy—

The Stanley O Tightener sets a new standard of efficiency for tensioning steel strapping to the required maximum with a manually-operated steel strapping tool with unlimited take-up.

The O Tightener is versatile . . . used to steel strap packages of varying sizes, shapes and weights. Operates with equal ease and speed in any position. Easy to handle, and requiring fewer strokes for take-up, it reduces operator fatigue and saves time. It's a strap-saver too! Applying seals behind tensioning wheel cuts overlap to minimum required for maximum joint security. Tightening action is more positive because there are *two* holding pawls on tensioning wheel. Removal from strapping is instantaneous. The operator returns tightening lever to down position and slides tool from strapping.

FEATURES

- **Insertion, alignment of strapping is easy, quick.**
- **Light weight and balance assure handling ease.**
- **Sturdy construction means long life.**
- **Has unlimited take-up.**
- **Seals may be applied in front of or behind tensioning wheel.**

MODEL	OL 3	3/8" STRAP
	OL 4	1/2"
	OL 5	5/8"
MODEL	OM 5	5/8" STRAP
	OM 6	3/4"

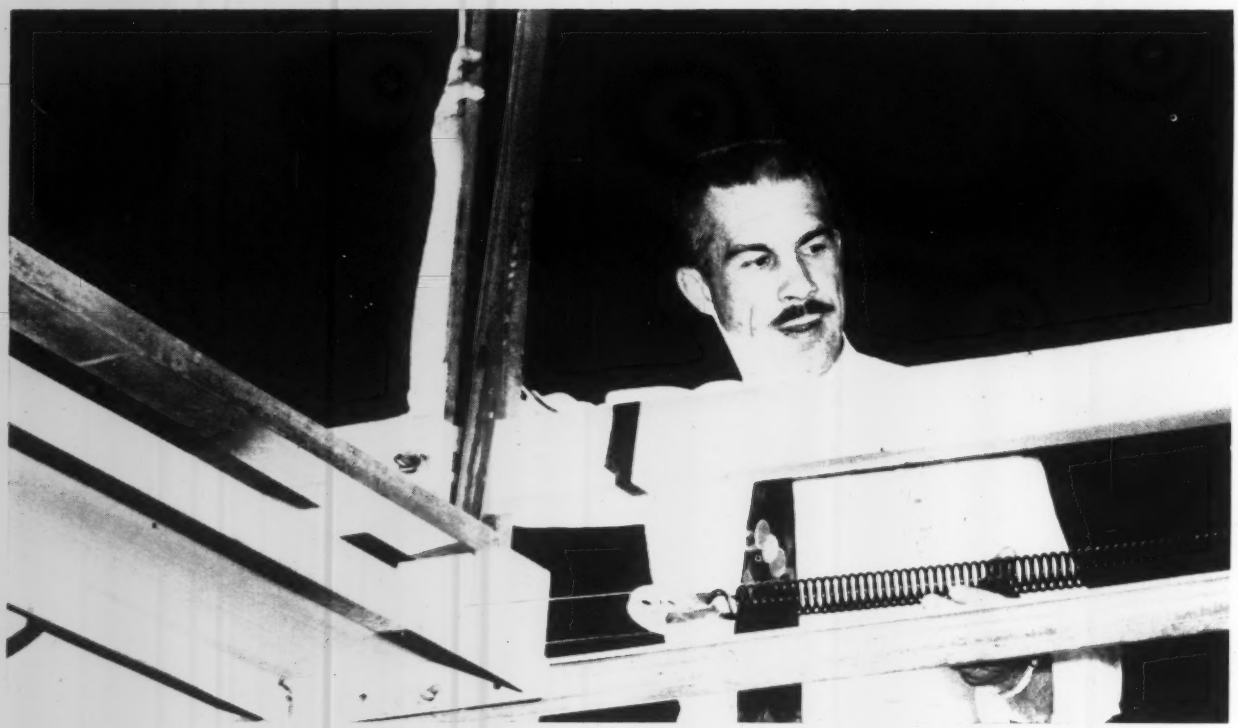
For more information, write STANLEY STEEL STRAPPING, Division of The Stanley Works, Dept. L, 1301 Corbin Ave., New Britain, Conn.

STANLEY **INSURE IT - SECURE IT WITH STANLEY STEEL STRAPPING**

AMERICA BUILDS BETTER AND LIVES BETTER WITH STANLEY

STANLEY

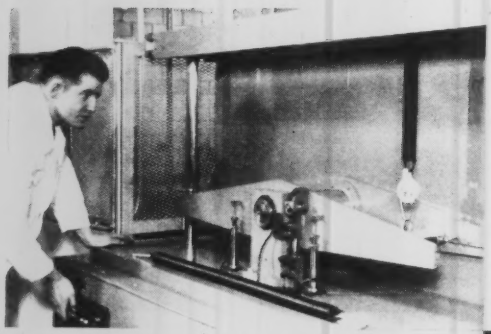
This famous trademark distinguishes over 20,000 quality products of The Stanley Works - hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • stampings • springs • coatings • strip steel • steel strapping — made in 24 plants in the United States, Canada, England and Germany.



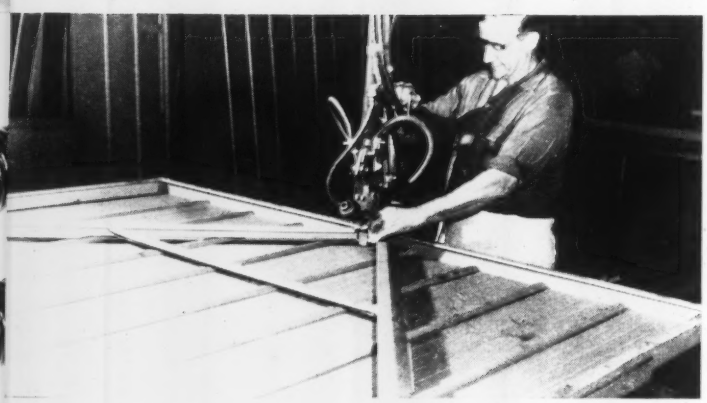
At Steel Door . . .

USS American Springs

thanks to AS&W

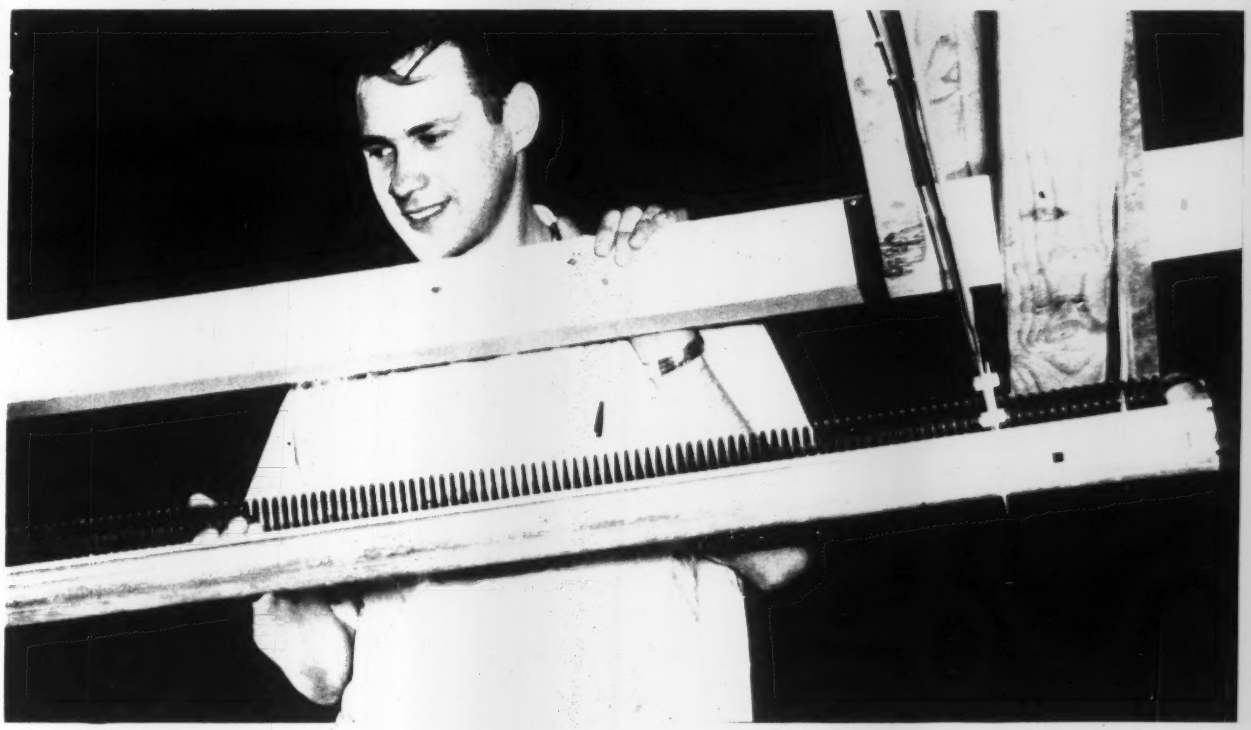


In the American Steel & Wire Fatigue Laboratory, a technician runs tests on a USS American Spring, designed for Steel Door use. On the basis of this test a change in hook design was recommended to give longer spring life.



A Steel Door workman assembles a Berry One-Piece Door. This company uses steel exclusively for all doors because of its many consumer advantages. Steel is stable, won't warp or swell. Steel doors need less maintenance and preparation, and steel doors are easy to operate.

This close-up shows the improved hook on the extension springs supplied by American Steel & Wire for the Steel Door overhead garage doors.



stretched 31,000 times and still going strong...

Spring Engineering Research Service

The Steel Door Corporation, Birmingham, Michigan, is the world's largest manufacturer of residential garage doors. For the production of these doors they use about 150,000 USS American Springs every year. Steel Door asked American Steel & Wire for a statistical evaluation of the fatigue life of the extension hook-type springs they use. The AS&W Spring Engineering Research Service tested these springs in the Fatigue Laboratory and recommended a change in hook design.

So successful was this design change that the life of the springs has been materially increased. At the Steel Door plant a cycle test was set up using USS American Springs on an overhead door. At the present time these springs have completed over 31,000 cycles without showing any sign of failure. This is the equivalent of 25 years of normal usage.

Mr. Ralph Qualman, Advertising Director and Service Manager, says: "It is extremely important that the springs—especially those used on sectional doors where the strain is greatest—have proper tension and a long life. American Steel & Wire supplies Steel Door with springs that meet their engineering specification and life expectancy."

If you have a spring problem or would like advice on the use of springs in your product, get in touch with our general offices in Cleveland, or any American Steel & Wire Sales Office. You can benefit from the knowledge of AS&W's Spring Engineering Research Service. The Service has been engaged in laboratory experiments of static and dynamic testing for 20 years and has accumulated invaluable data on stress and fatigue life of steel springs, while endeavoring to improve efficiency in the use of steel—from steel chemistry through product application—to more economically cope with today's rigorous demands. This accumulated knowledge of the AS&W Spring Engineering Research Service is at your disposal. *American Steel & Wire, General Offices: Rockefeller Building, Cleveland 13, Ohio.*

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American Steel & Wire Division of USS **United States Steel**

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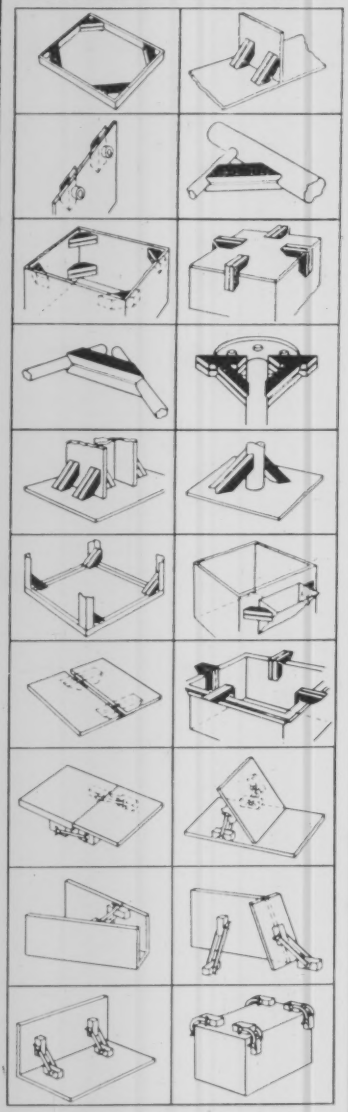

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Cut metal cutting costs with famous STAR quality blades. Because they are fabricated from the finest alloyed, properly heat-treated steel, they last longer. Teeth are formed by specially designed equipment to insure top performance . . . fast, easy cutting.

Star Band Saw Blades are available in Outline, Skip Tooth and Gored-Tooth types for a variety of cutting jobs on ferrous and non-ferrous metals and plastics. Up to and including ½" size, they are packed in the handy new *Reel-Pac* Dispenser. It brings new convenience to handling and storing band saw blades. You simply draw out the amount you need, any excess withdrawn can be easily slipped back onto the reel. The sturdy, permanent plastic Reel-Pac holds 100 feet of blades. Other lengths and sizes as well as welded-to-length in conventional packages.

FREE TO YOU. An attractive and informative STAR METAL CUTTING WALL CHART to put up in your shop. Also, STAR METAL CUTTING GUIDEBOOK – fact-filled with valuable information about economical, efficient metal cutting. Clip and mail the coupon *today*.

CLEMSON BROS., INC.
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☐ Please send the STAR Metal Cutting Guide that contains information on blade types, cutting techniques, feeds and speeds and general metal cutting information.

☐ Please send the STAR Metal Cutting Chart–A handy guide for the shop metal worker.

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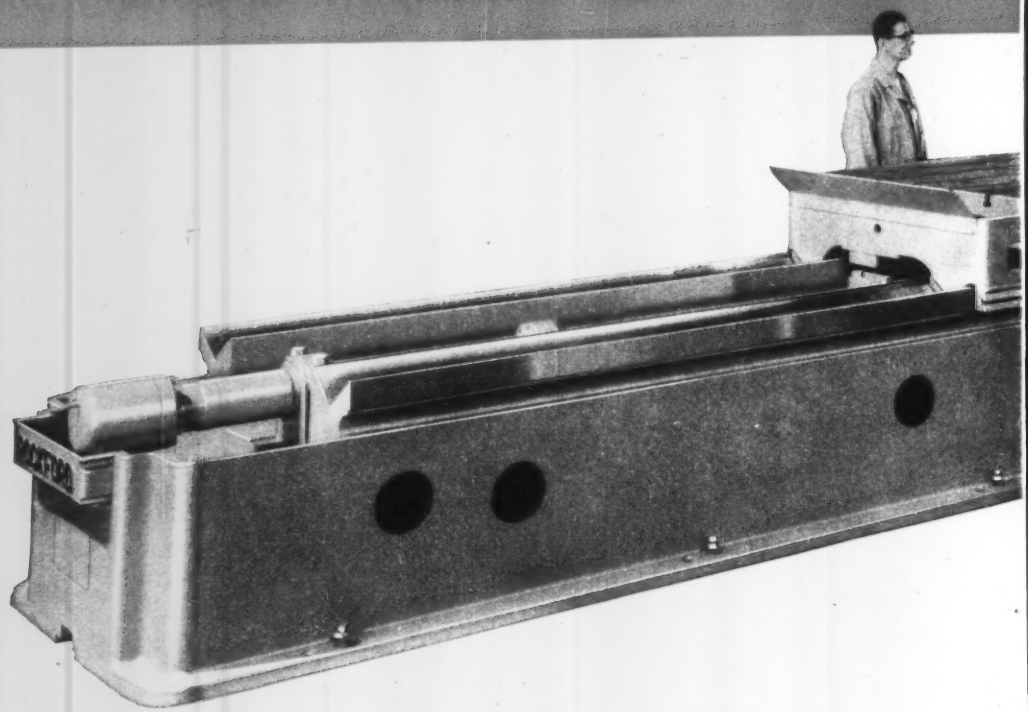

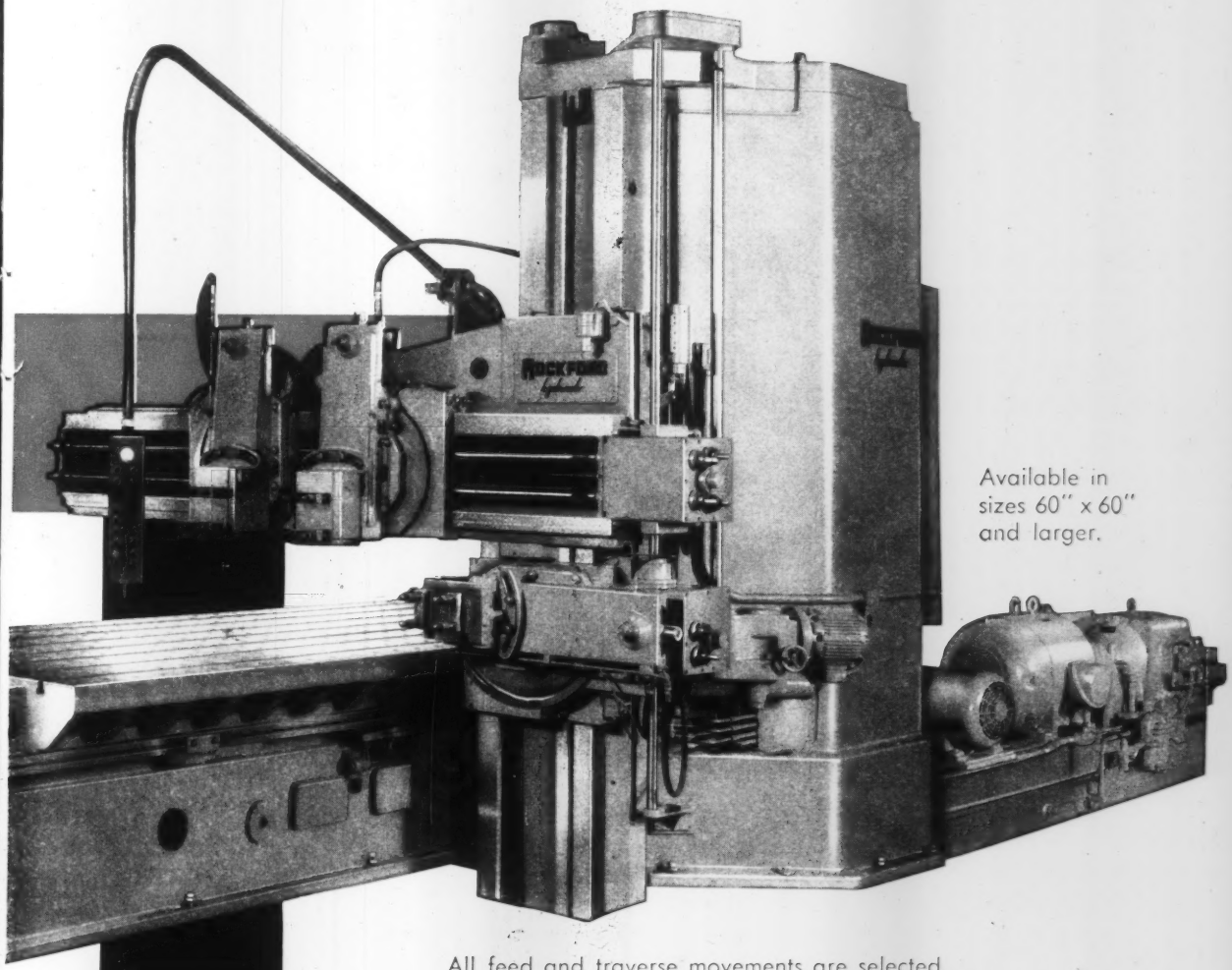

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complete pendant control speeds operation and set-up

All feed and traverse movements are selected and operated from the push button station of this new Rockford hydraulic planer. Two-speed traverse motors — high speed for approximate positioning, and slow speed for extremely close power positioning of rail and side heads — eliminate the need for manual positioning in setting-up for a job.

Extra-rugged construction affords use of most modern cutting tools and cutting techniques. The machine is equipped with the new high speed h3 triple circuit.

Get full details on the wide production flexibility of this new hydraulic planer from any Rockford Machine Tool Co. representative, or write directly to us.

h HYDRAULIC

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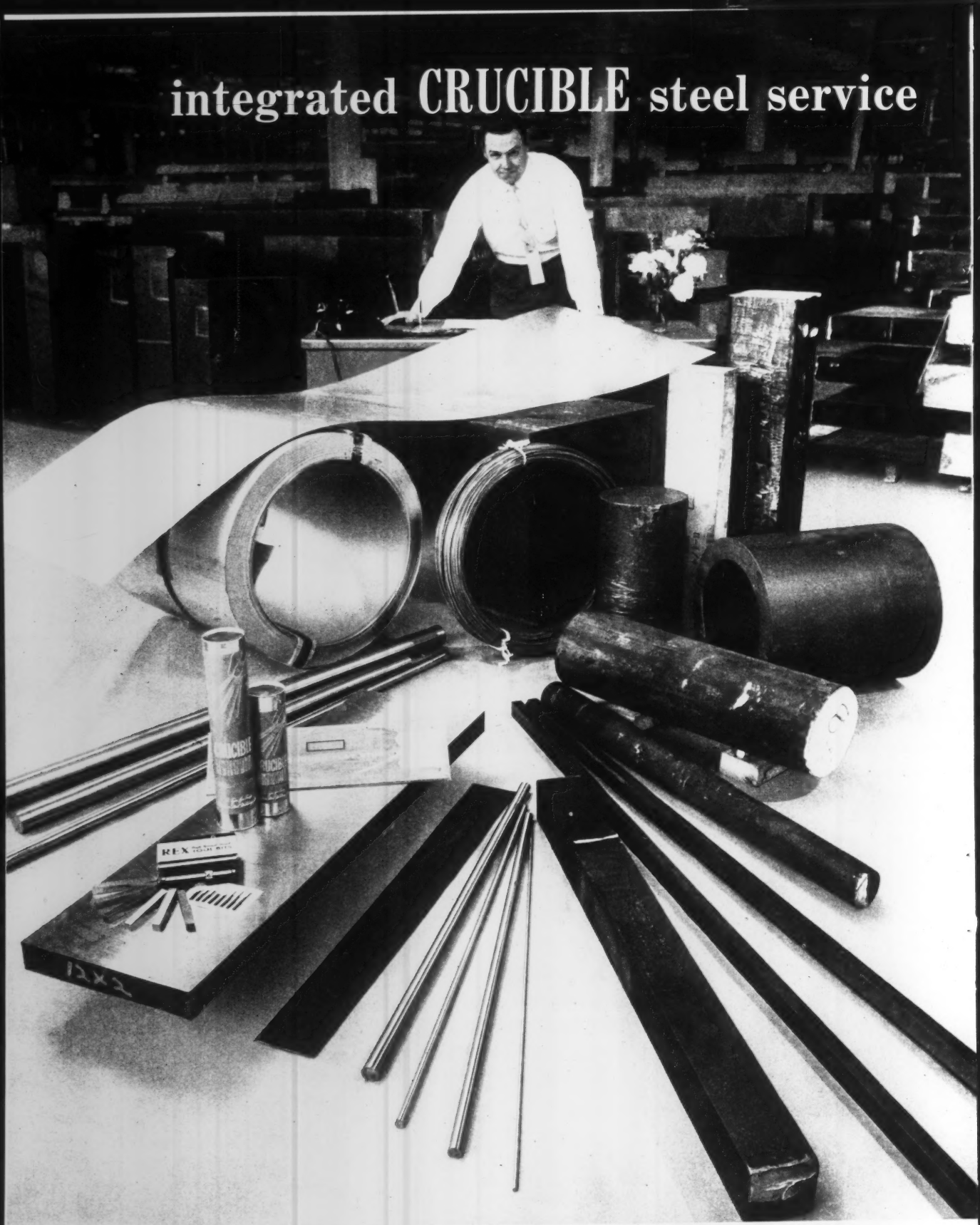
2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

integrated CRUCIBLE steel service



Average Crucible warehouse stocks these and many other specialty steel items in a tremendous range of sizes and analyses. A single phone call will bring any or all of them to you *in the quantity you need.*

keeps 16,000 specialty steel items flowing from mills to local warehouses for immediate delivery to you

Every day, thousands of specialty steel items flow from Crucible mills to Crucible's 27 strategically located warehouses – keeping local stocks at levels that meet customers' *maximum* needs.

Here's how these continually-replenished stocks are helping one steel buyer today. He says:

"We reduced plant inventory to cut operating costs and free working capital and space. This is smart business. But it creates problems, too–like when production requisitions an extra-large order of 36" x 120" Type 304 stainless sheet, 20 ga and 2B finish – *and needs it overnight.* I solve this problem by calling the Crucible warehouse. It's set up to give us the kinds of steels we need from stock."

All 27 Crucible warehouses offer in-stock delivery of approximately 16,000 specialty steel items, ranging from tool steels to stainless sheet and wire. They're able to maintain these high inventories because they're part of Crucible's completely integrated operation, from mining the ore to steelmaking to warehouse delivery to you. If you'd like to know all the ways these warehouses can serve you, phone or visit the one near you today. *Crucible Steel Company of America, Dept. PL15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

Inventory specialists keep warehouse stock records up-to-date to give you fast, accurate answers on availability of every analysis.

Steels you ordered yesterday arrive today at your receiving platform — dependably on schedule.

Warehouses maintain modern equipment, like this electronically-controlled flame cutter, for fast processing of specialty items.

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

TOOL STEELS–Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS–Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel

ALLOY STEELS – Bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS – Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

HOLLOW TOOL STEEL

WELDING AND HARD FACING ROD

PLASTIC MOLD STEELS

PERMANENT MAGNETS

– and many others

CRUCIBLE STEEL COMPANY OF AMERICA

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HOW THE ENGINEERING SERVICES OF

Central Foundry

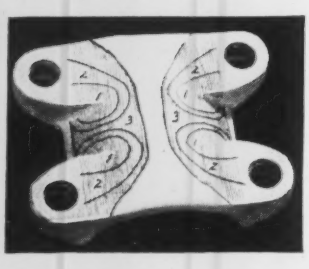
help you design better castings at lower cost

Many new developments here at Central Foundry have broadened the field of application for castings and have given design engineers greater latitude. To assist you in exploiting these new methods and materials to fullest advantage, each of our engineering departments—design, experimental, process and metallurgy—is at your disposal. Central Foundry is also using a number of testing techniques such as stress analysis, cobalt radiography and sonic testing, that have proven invaluable in lowering the cost and improving the quality of castings. These procedures help us to determine the best design and method of producing a casting, either by the green sand method or the shell mold process, and the best material for the casting, either grey iron, malleable iron or ArmaSteel.

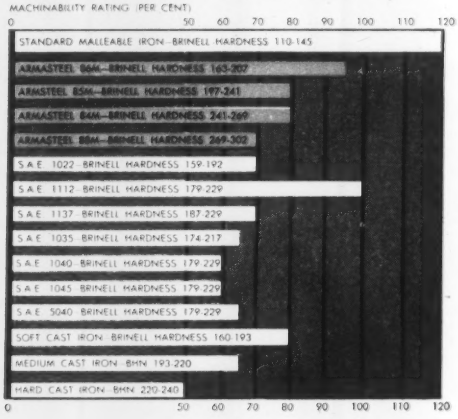
Central Foundry has the capacity to deliver, on schedule, quality castings in production quantities.

STRESS ANALYSIS FOR IMPROVED DESIGN

An important part of our engineering services is the stress analysis laboratory. Stress analysis discovers the amount of stress on a part due to its service function and is an important aid in determining and improving the strength of a part. Improved casting design can be accomplished through the use of stress-analysis by more effectively distributing the metal in the part. The U-bolt anchor plate shown here is a case in point. Our customer was experiencing failures in this part and asked us to see what we could do to solve the problem. Using stress analysis the part was completely redesigned for maximum efficiency. The redesigned part is 35% stronger, 42% lighter and less costly.



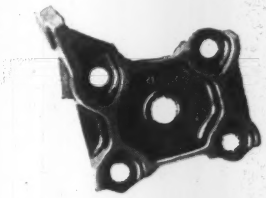
EXCELLENT MACHINABILITY FOR INCREASED PRODUCTION


MACHINABILITY RATING (PER CENT)
0
50
60
70
80
90
100
110
120
STANDARD MALLEABLE IRON - BRINELL HARDNESS 110-145
ARMASTEEL B6M - BRINELL HARDNESS 163-207
ARMSTEEL B5M - BRINELL HARDNESS 197-241
ARMASTEEL B4M - BRINELL HARDNESS 241-269
ARMASTEEL B8M - BRINELL HARDNESS 269-302
S.A.E. 1022 - BRINELL HARDNESS 159-192
S.A.E. 1112 - BRINELL HARDNESS 179-229
S.A.E. 1137 - BRINELL HARDNESS 187-229
S.A.E. 1035 - BRINELL HARDNESS 174-217
S.A.E. 1040 - BRINELL HARDNESS 179-229
S.A.E. 1045 - BRINELL HARDNESS 179-229
S.A.E. 5040 - BRINELL HARDNESS 179-229
SOFT CAST IRON - BRINELL HARDNESS 160-193
MEDIUM CAST IRON - BHN 193-220
HARD CAST IRON - BHN 220-240

CENTRAL FOUNDRY DIVISION

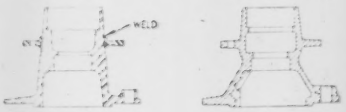
REDESIGN FOR STRENGTH

This is a rear spring clip pad that was converted to a casting with the help of stress analysis. The clip pad supports the shock absorber arm and clamps the spring to the rear axle of an automobile. When produced as a stamping, this part weighed 4-1/4 pounds. However, when designed as an ArmaSteel casting, weight was reduced to 2-9/10 pounds. Most important, based on comparative stress analysis tests, the casting is *30% stronger* than the stamping. (In addition, the holes are produced by the foundry, making it unnecessary for the customer to punch them.) This conversion from a stamping to a casting resulted not only in increased strength, but in substantial cost savings, as well.



REDESIGN FOR IMPROVED PRODUCT AND ECONOMY

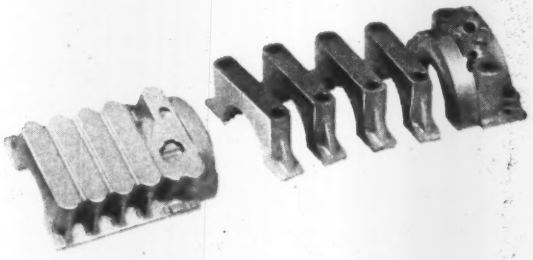
Many of our customers have found that redesigning a product to be made as an ArmaSteel casting rather than as a fabrication, forging or stamping, has resulted in a better part at less cost. The fabricated design of a rear wheel truck hub at the left consists of a forged base with a steel plate welded in place to form the smaller flange. The casting on the right, designed jointly by the customer and our engineers, is of single piece construction, is lighter, stronger and less costly than the fabricated design and eliminates the fitting and welding of the small flange.



FABRICATED DESIGN ARMASTEEL CASTING

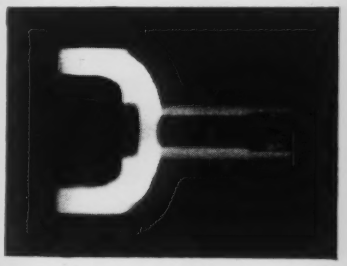
PROCESS ENGINEERING FOR LOWER COST

Our process engineers are continually looking for ways to more economically produce castings, thus lowering the finished-product cost. Shown here is a single casting that combines 5 bearing caps used on a V-8 engine. The casting is almost completely machined as a single piece, and the parts are then separated in a final operation. Substantial savings are realized in both casting and machining costs.



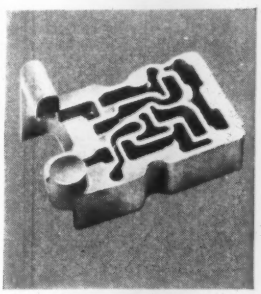
COBALT RADIOGRAPHY FOR ASSURED QUALITY

Radiography, by means of Cobalt 60, has drastically reduced the time required to check castings and is an important aid in obtaining the best possible casting quality. In an effort to eliminate a machining operation on the universal joint yoke shown here, a design change was made in the tube section of the part. When sample castings of the new design were checked radiographically, it was immediately apparent that the design was unsatisfactory since it caused acute metal feeding problems. By redesigning and further checking by radiography, Central Foundry was able to produce, in the shortest possible time, a lighter casting which required less machining in our customer's plant.



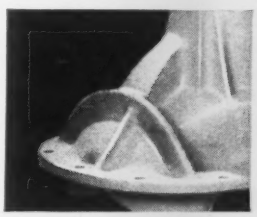
SHELL MOLDING FOR GREATER ACCURACY

Shell molding, a relatively new process of making castings, is now being employed extensively for fast, simple production of complicated castings, such as those requiring narrow, accurate passages and cross sections. It is practically impossible to produce certain parts in any other way without prohibitive costs; this is especially true of ferrous metals. Complicated parts like the manual control valve body shown here, a part of the automatic transmission of a military vehicle, are readily cast in grey iron when the shell process is utilized. The part had been considered as an aluminum die casting, but was thought unsatisfactory because of adverse expansion and wear characteristics. In this case, meeting the requirements for very close tolerances on the thickness and location of ports was made possible by the shell molding process.



REDESIGN FOR WEIGHT REDUCTION

Vehicle weight reduction is a matter of increasing importance to design engineers . . . and more and more existing parts are being converted from a low or medium to a high strength ferrous material such as ArmaSteel. On the left is a grey iron differential carrier currently used in an automobile. By taking advantage of the superior physical properties of ArmaSteel, it was possible to design the part on the right which is *five pounds lighter*. The modulus of elasticity of ArmaSteel is approximately 60% greater (the tensile strength about twice as great) than the grey iron material.

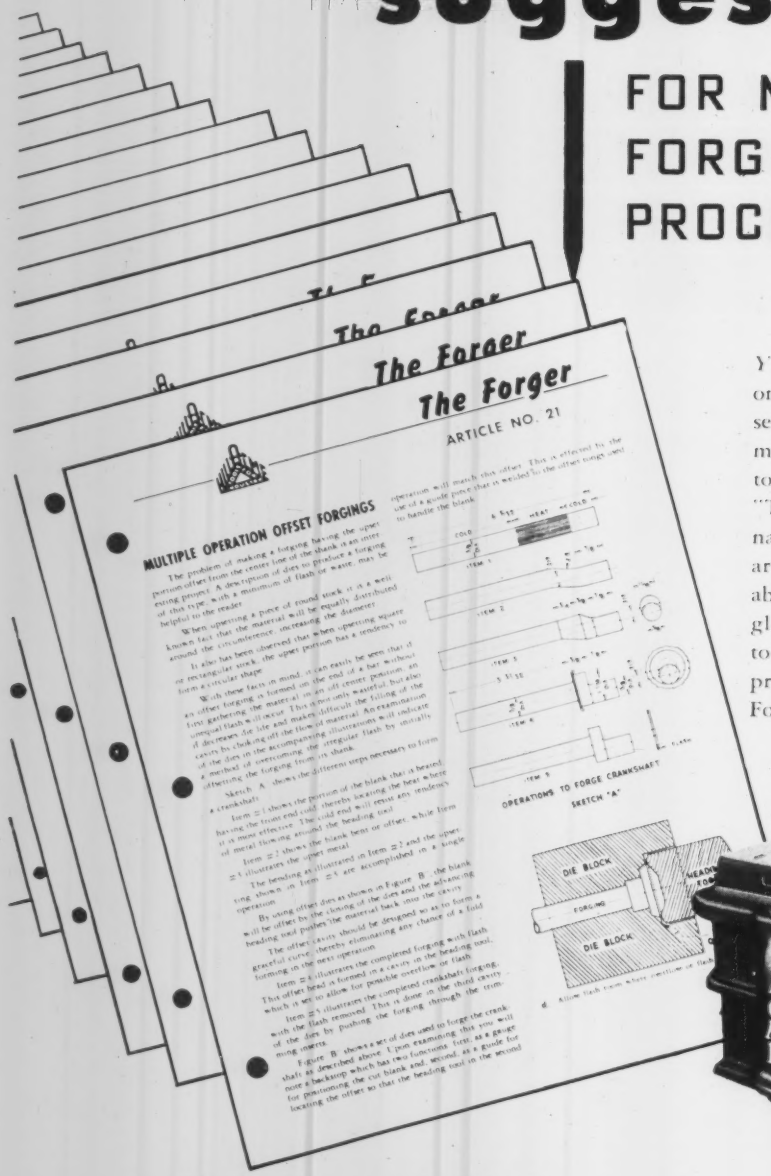


90

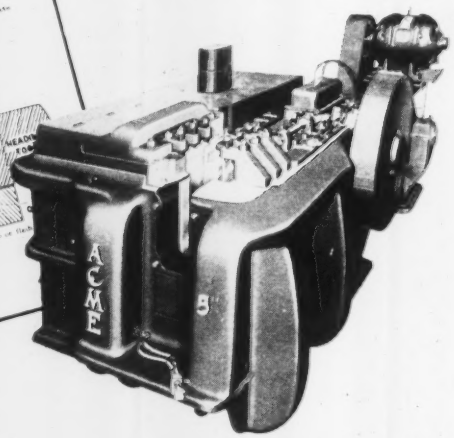
GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN • DEPT. 2.0

helpful suggestions

FOR MODERN FORGING PROCEDURE



You are invited to have your name placed on our mailing list to receive this valuable series of articles on up-to-date forging methods and procedures. We will be glad to send a complete set of twenty one issues of "The Forger" in addition to placing your name on our mailing list to receive future articles as they are prepared. There is absolutely no charge for this service. We are glad to make this good will contribution to the advancement of modern forging practice as executed on ACME XN Forging Machines.



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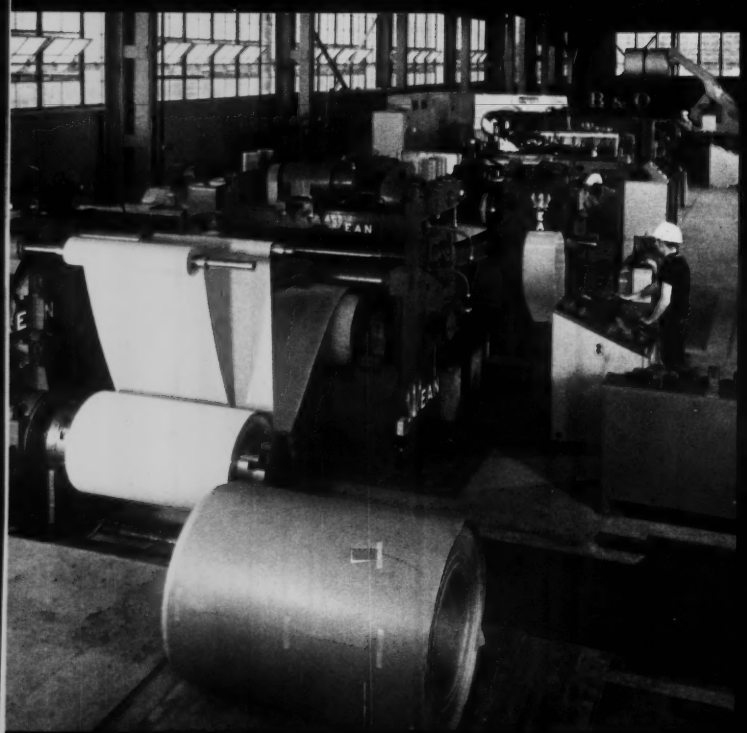
J & L's Completely New Stainless Mill . . .

designed and engineered to give you the fastest delivery on Quality Stainless Sheet and Strip

Now you can demand the quality you need and get the service you want from the most advanced stainless steel sheet and strip source in the industry. J & L's new Sendzimir Mill at Louisville, Ohio, is the result of years of planning by specialists to provide a new facility of such perfection that yield of the highest quality is assured.

J & L can now offer stainless sheet and strip to the most exacting specifications, producing stainless sheets to extremely close tolerances in widths up to 48 inches.

By efficient, flexible scheduling and adequate inventory support, J & L offers stainless steel buyers everywhere the fastest possible service.



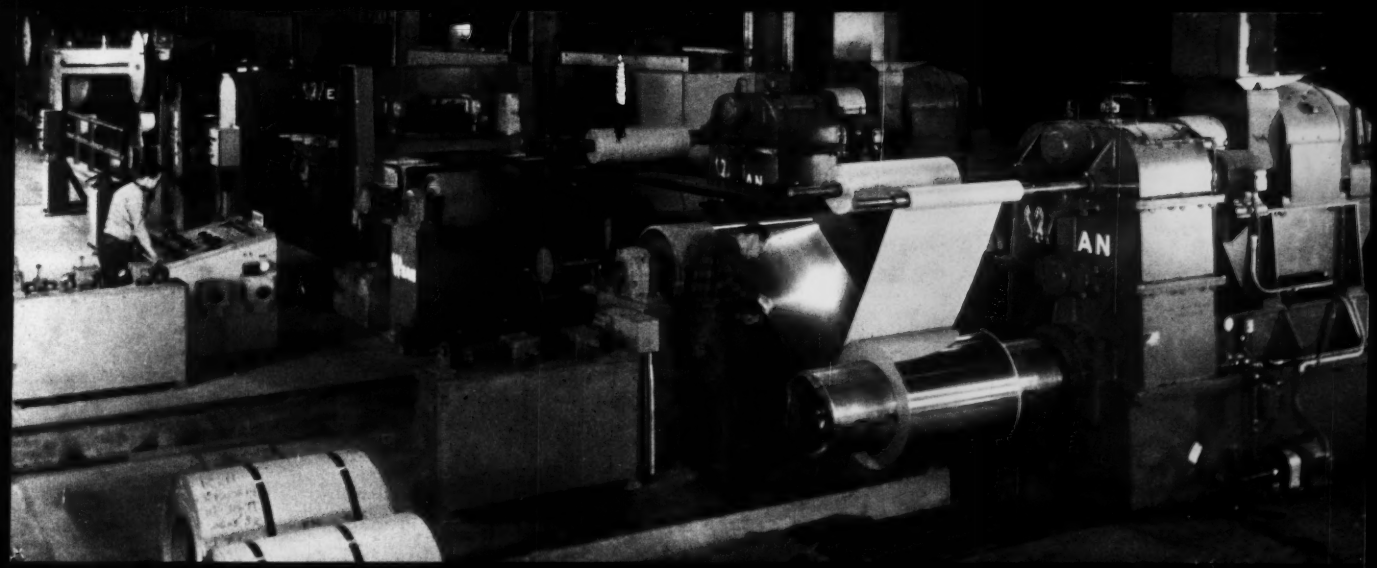
▲ Coil Preparation Line for Incoming Hot Rolled Sheet

▲ The 54" Temper Mill

▼ Hot Anneal Furnace—Entry End

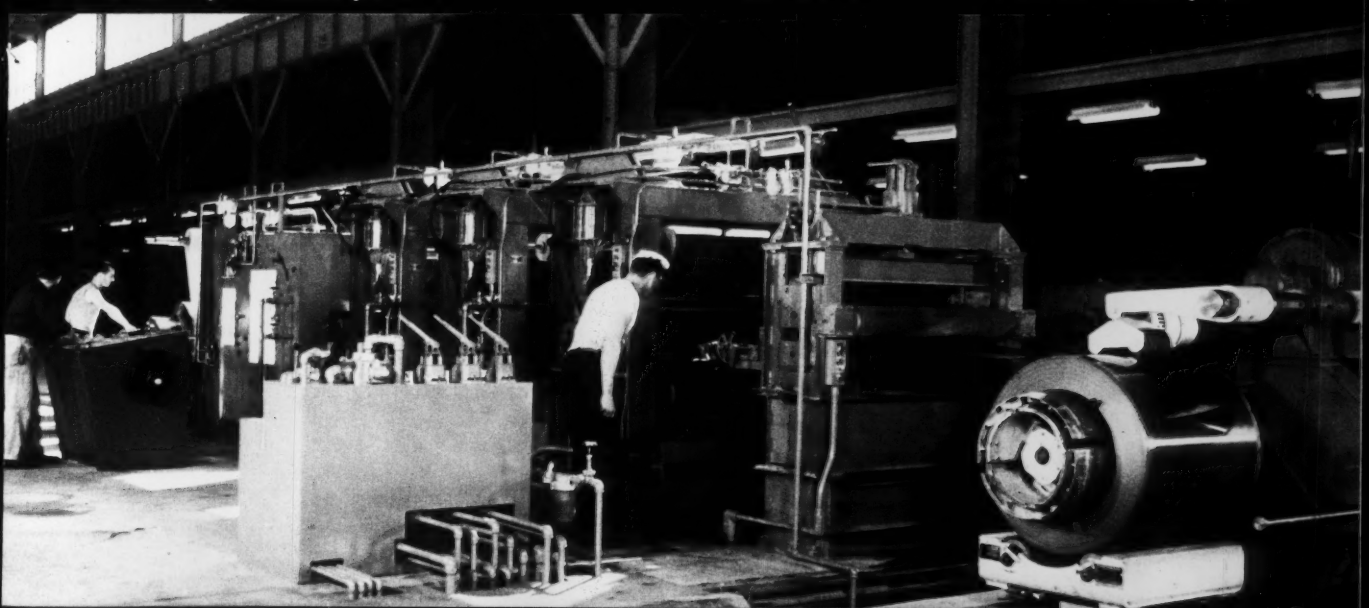
▲ The Sendzimir Mill

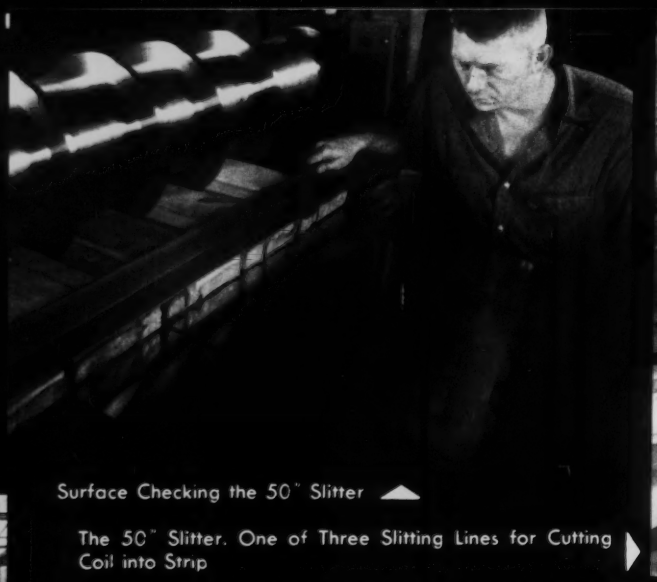
Interior View of the Intricate Mechanism of the Sendzimir Mill ▶



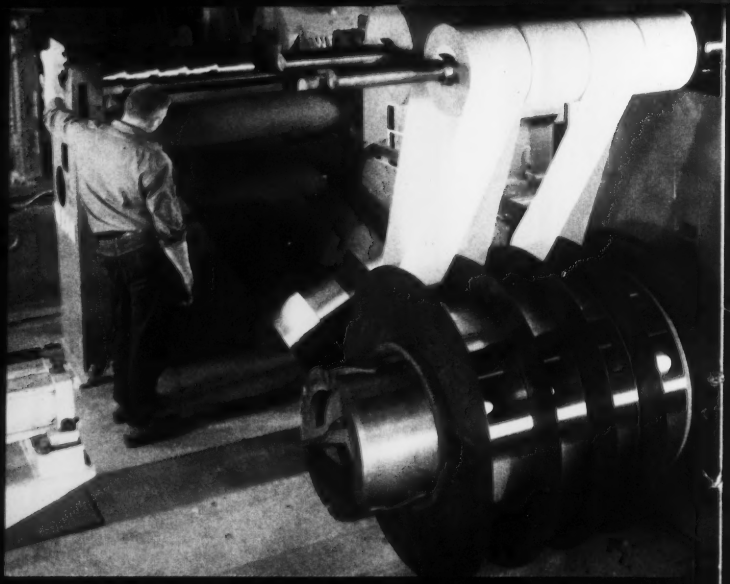
Scouring and Scrubbing Line ▼

▲ Cold Roll Anneal and Pickle Line—Discharge End





Surface Checking the 50" Slitter



The 50" Slitter. One of Three Slitting Lines for Cutting Coil into Strip

One of the two Shear-to-Length Lines for Cutting Coils into Specified Sheet Lengths

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LITHO USA

CALENDAR
OF MEETINGS

Dec. 8-10, American Nuclear Society: Winter meeting, Sheraton-Cadillac Hotel, Detroit. Society's address: Chicago 1, Ill. Executive secretary: Octave J. DuTemple.

Dec. 10-11, Industrial Truck Association: Annual meeting, Roosevelt Hotel, New York. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

Dec. 12-14, Association of Steel Distributors Inc.: Annual meeting, Hotel Pierre, New York. Association's address: 29 Broadway, New York 6, N. Y. Counsel: Morris Rosoff.

Dec. 28-31, American Marketing Association: Winter meeting and exhibit, Morrison Hotel, Chicago. Association's address: 27 E. Monroe St., Chicago, Ill. Secretary: Schuyler E. Otteson.

1959

Jan. 14-16, American Management Association: Research and development conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. R&D division's manager: Philip Marvin.

Jan. 14-18, National Tool & Die Manufacturers Association: Winter board meeting, Emerald Beach Hotel, Nassau, Bahama Islands. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Jan. 15, Malleable Founders' Society: Semiannual meeting, Hotel Sheraton-Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Jan. 19-20, Industrial Heating Equipment Association: Annual meeting, Hotel Sheraton-Cleveland, Cleveland. Association's address: Associations Bldg., Washington 6, D. C. Secretary: Robert E. Fleming.

Jan. 22, Hoist Manufacturers Association: Annual meeting, Palm Beach Biltmore Hotel, Palm Beach, Fla. Association's address: 1 Thomas Circle, Washington 5, D. C. Executive secretary: Joe H. Peritz.

Jan. 22-23, National Industrial Conference Board Inc.: General session for all associates, Commodore Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

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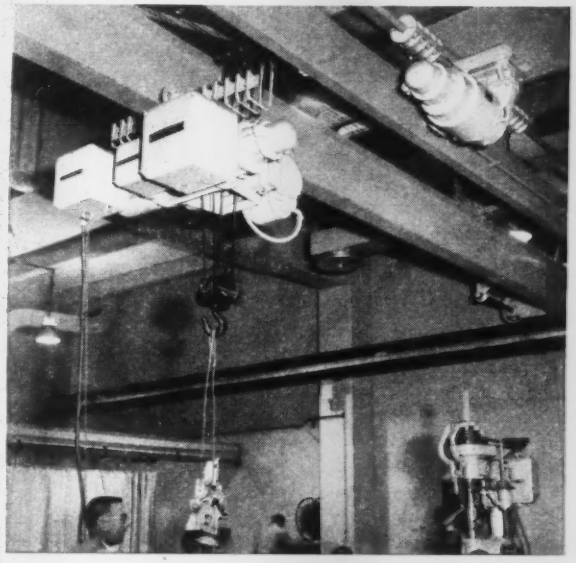
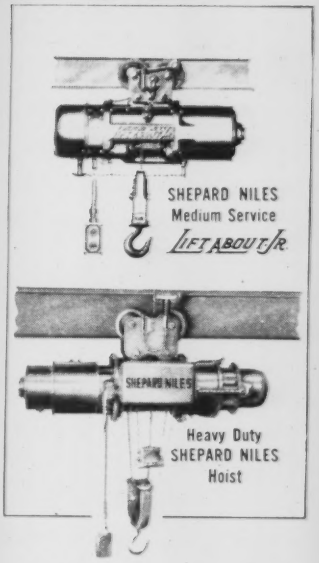
WITH TROUBLE-FREE PERFORMANCE

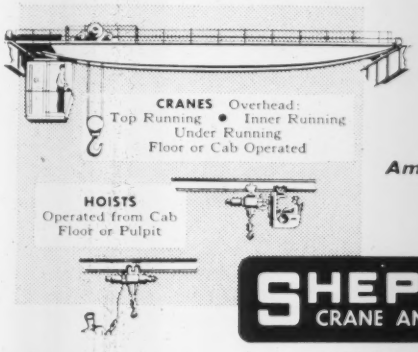


You can be certain of years of thrifty, dependable service when you invest in a Shepard Niles hoist. Long after you have written off the original cost, your Shepard Niles hoist will still be speeding raw materials and work-in-process through the air.

Choose from medium and heavy duty capacities with slow, medium or fast speeds . . . built for cycle duty, heavy intermittent duty, medium duty and light occasional service . . . available with short to long lifts, standard or close headroom, manual or magnetic controls.

Send for illustrated Hoist bulletin today . . . or ask that a Shepard Niles representative call—there's NO OBLIGATION.





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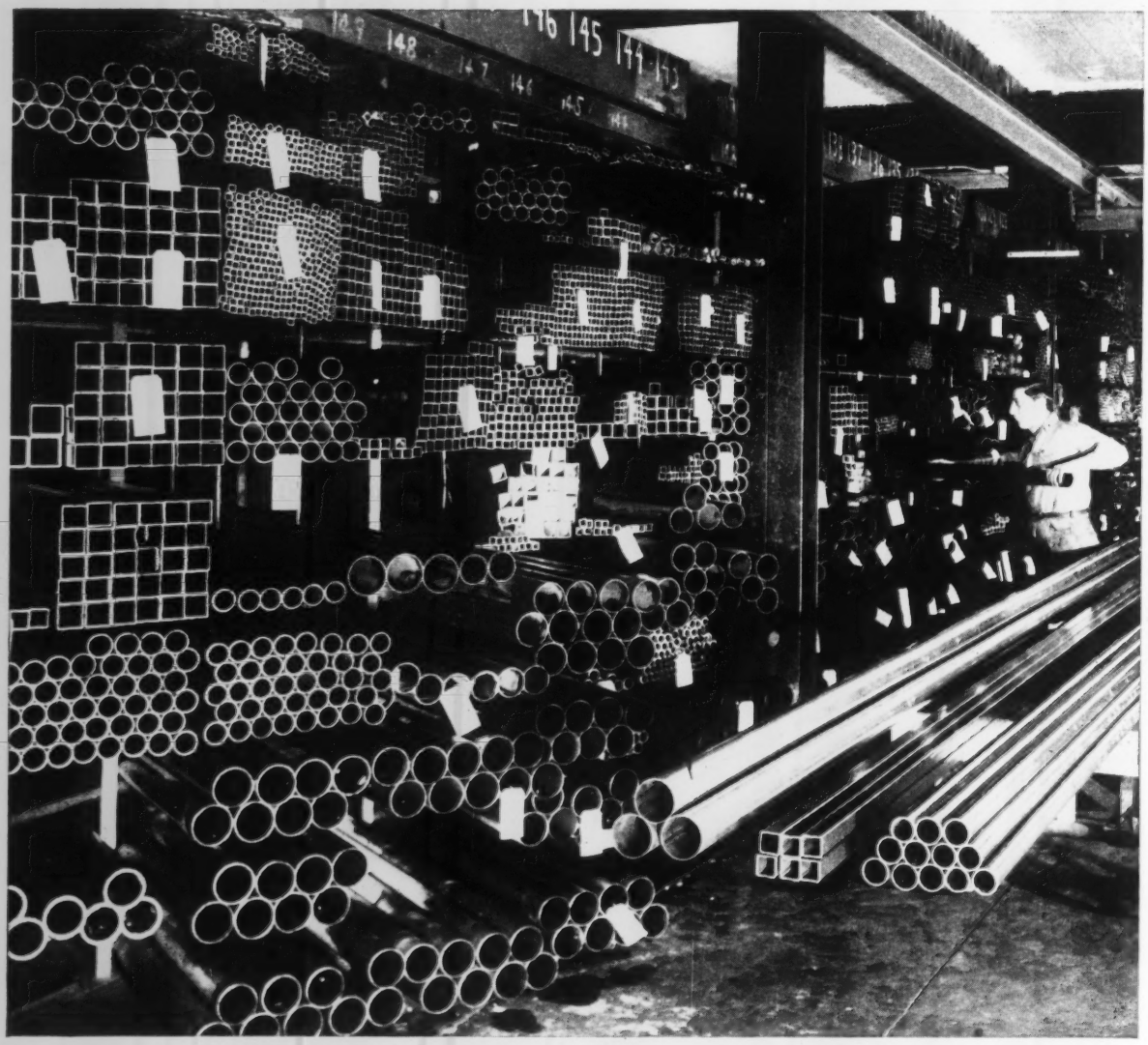

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It pays to analyze your tubing requirements with a Ryerson tubing specialist. He is well qualified to help you select the right tubing for your purpose from Ryerson's diversified stocks.

The Ryerson specialist knows tubing—knows what will work best and why. In many cases, he can recommend a type that will do a better job for you—perhaps a newer type that will save you money, either in first cost or in the cost of using it.

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STEEL

December 1, 1958

Metalworking Outlook

Autos Roll Faster

The strike-plagued automotive industry has finally shifted to high but hasn't reached overdrive yet. Auto assemblies hit 148,000 last week, the highest for the year, but that's still below the year-ago levels. Studebaker-Packard Corp.'s walkout didn't help, and Chrysler Corp. was still struggling for full momentum after its many work stoppages. Bargaining talks between United Auto Workers and International Harvester Co. have been recessed until today (Dec. 1). Late last week, the month-and-a-half strike by the UAW against Caterpillar Tractor Co. appeared no closer to solution.

The Re-employment 'Lag'

Get set for a big union campaign aimed at the public and the new Congress, charging that the present lag in re-employment is a threat to continued recovery. The AFL-CIO's Economic Policy Committee has fired the opening barrage. Its monthly economic report says that factory output went up 9 per cent between April and September, while factory jobs increased only 2 per cent. Every employer knows this is normal. And on the down side, jobs decline more slowly than production falls. Unemployment fell to a low of 1.9 million in the 1955-57 boom, then rose to a recession peak of 5.4 million last June. But rising productivity and a growing labor force will make it difficult to reduce joblessness below 3 million in the near future.

Steelworkers' Fringes Jump

Fringe benefits to steelworkers now average 75 cents an hour, vs. 63 cents last year. Average hourly payments by steel companies for straight-time work have more than doubled since 1947, but fringes have jumped about four and a half times, says the American Iron & Steel Institute.

World Steel Output Dips

World steel production totaled 216.3 million net tons in the first nine months, vs. 244 million in the same period of 1957. Every major nation's output declined except Russia's, which jumped from 41.6 million tons last year to 45 million in the 1958 period. The European Coal & Steel Community's production fell only slightly—from 48.6 million tons to 48.2 million. The U. S., of course, had the sharpest drop—from 87.7 million tons to 59.1 million.

America's Ferrous Expansion

Despite America's poor steel year, look for continued expansion. Principal programs (started, finished, or in progress this year) include: 20 rolling mills; more than 20 million tons of new sintering capacity installed; new continuous annealing lines, new steelmaking furnaces, mostly electric, plus enlargement and rebuilding of other furnaces; new electrolytic tin plate lines; coke oven batteries; new pipe mills; a new battery of soaking pits; a new coal

Technical Outlook—Page 69 Market Outlook—Page 101

cleaning plant; an iron powder plant; several giant ladles; new research centers; pilot facilities;—and completion of a $300 million taconite project.

Machinery's Recovery Uneven

Watch new orders for machinery. Of all segments of the economy hit by the recession, this one has been socked the hardest. Since last January, new orders have trended upward, although unevenly. They have probably retraced, on the average, nearly half the 1956-58 decline. New orders for cutting-type machine tools amounted to $28.5 million in October, compared with $20.1 million in September and the average of $22.2 million for the first nine months. Resistance welding equipment makers received $2.9 million in new orders in October, vs. $1.1 million in September. But industrial furnace makers didn't fare so well—new orders of $3.1 million in October were 36 per cent below September's.

Transistors: 66 Million in '59

Look for 66 million transistors to be sold in 1959, vs. 44 million in 1958 and 13 million in 1956, the year the device came into its own. Next year's volume of $140 million will go into portable radios and phonographs ($30 million), auto radios ($10 million), and industrial military uses ($100 million).

Defense Tries To Hold Budget Line

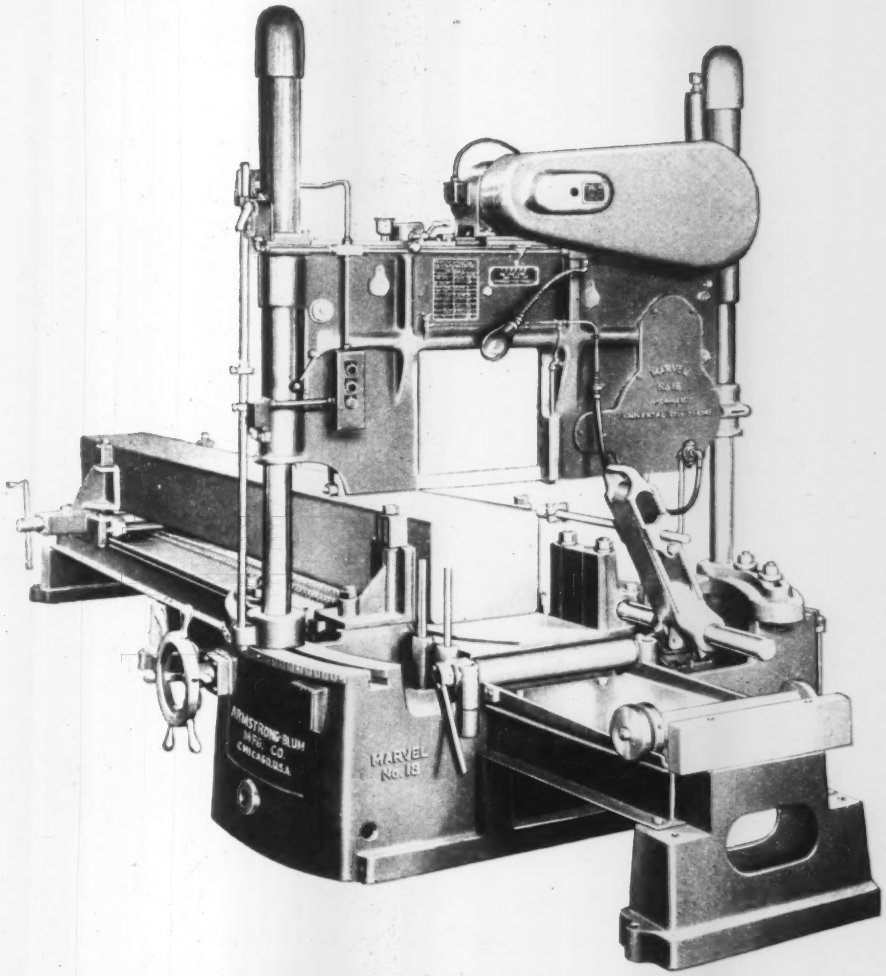
The Pentagon has just started to cut back, stretch out, and cancel. The Navy will terminate its Seamaster program with delivery of 14 of the 80 ton jets instead of 24. Savings: Nearly $60 million. Observers expect cuts in our IRBM to come soon. Other candidates for cuts or cancellations: The Titan ICBM, the Nike Hercules or Bomarc, and the Talos. The extent of missile duplication is indicated by Association of Missile & Rocket Industries. It says we have six ICBM projects, four IRBM, 16 drone-type missiles, 20 experimental birds, eight with 100-1500-mile ranges, 18 with 20-100 mile ranges, and 15 with ranges under 20 miles.

Kaiser Shows Aluminum Car

Detroiters are flocking to see an all-aluminum car displayed by Kaiser Aluminum & Chemical Sales Inc. Called the Pele, the car has body panels of stamped aluminum. Doors are two-piece, diecast aluminum with sculptured exterior. Center sections of both front and rear bumpers are aluminum extrusions. The entire front-end structure is made from aluminum sheets.

Straws in the Wind

Future pace of the business recovery will be much slower in coming months, believes Dr. John K. Langum of Business Economics Inc. . . . Consumer prices remained steady in October at 123.7 of the 1947-49 average . . . Rail freight rates jump 17 per cent in Canada today (Dec. 1).



No Job too big or too tough . . .

for MARVEL "*Giant*" Hack Saws

These giant MARVEL Hydraulic Hack Saws (No. 18, Capacity 18" x 18"; and No. 24, Capacity 24" x 24") were *basically* designed for rapid and economical cut-off of BIG WORK. They are not merely "conventional" designs "stretched" to big capacity. They are truly designed and built with the ruggedness and rigidity necessary to withstand the rough treatment of sawing big work, even though the work is in the "toughest of the tough" alloys.

They are reliably fulfilling the cut-off requirements in innumerable steel mills, forge shops, structural shops, warehouses, and machine shops, with assured low tool cost and minimum kerf loss of steel.

In addition to cutting-off, they are reducing costs by eliminating further machining operations. Heat treated die blocks are being reclaimed for re-sinking by sawing off the worn face; columns, beams, pipe, and tubing are being sawed to *finished*, square ends, eliminating milling; angular sawing is done conveniently by swinging the upper structure on the base, to any angle up to 45 degrees—*without moving the work*.

Contemplating the modern trend toward ever tougher steels and larger sizes, these are the logical sawing machines to buy, not only for today's needs but for tomorrow's as well.

Write for Catalog

MARVEL *Metal Cutting* SAWS
Better Machines—Better Blades

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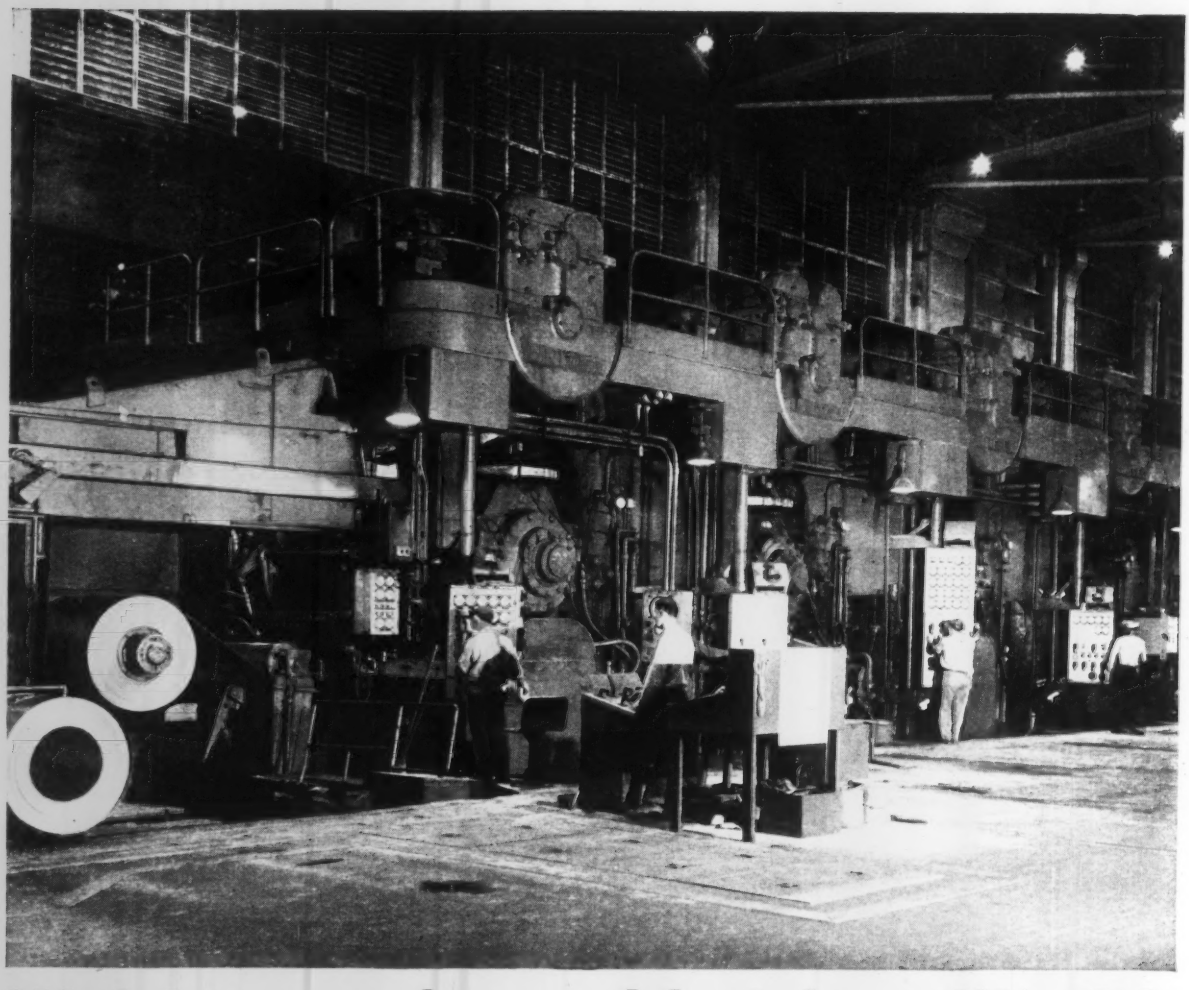


Weirton equips cold strip mill with double-poured Ni-hard working rolls

Ni-Hard nickel-chromium cast iron provides hardness of 80 to 82 Shore . . . provides long life, consistently good finish

Weirton Steel Company, a division of National Steel Corporation, is using double-poured Ni-Hard* nickel-chromium alloy iron working rolls on all five stands of its cold strip mill. These Ni-Hard rolls are 23-inches in diameter with a 52-inch face. Six stands in Weirton's hot strip mill are also equipped with Ni-Hard rolls.

Why Ni-Hard working rolls? Ni-Hard cast iron possesses a matrix structure in the mold cooled condition that is akin to that of heat treated steel. In addition, it contains a multitude of refined carbides which make an important contribution to its abrasion resistance. The resulting structure has great hardness, strength, and resistance to impact.

For your applications. Ni-Hard alloy possesses the fluidity and freezing range of the cast irons and can be readily cast in all forms and shapes common to the iron and steel foundry. If you'd like specific information concerning its application to your abrasion problem, write Inco. For details on double-poured Ni-Hard rolls, write the fabricator, United Engineering Company.

*Registered Trademark

The International Nickel Company, Inc.
67 Wall Street INCO New York 5, N. Y.

NI-HARD

NICKEL MAKES CASTINGS PERFORM BETTER LONGER

Depreciation Reform:

Let's Get Together!

Do you know that you may be paying 80 per cent taxes instead of the statutory rate of 52 per cent?

Such overtaxing is primarily the result of inadequate allowances for the depreciation of machinery and equipment which force corporations to overstate their taxable income.

As STEEL has pointed out in a series of editorials and articles this year, something should be done about it. At one time it looked as if relief would come from the last session of Congress, but proposed legislation failed—either because of the apathy of congressmen, or businessmen, or both.

Now the issue is again getting national attention. Accountants, lawyers, economists, and businessmen gathered at the Tax Institute Inc., Princeton, N. J., late last month to sit in on a depreciation forum.

The overwhelming majority agreed that depreciation inadequacies are the greatest single source of concern over the fairness of our present tax structure—with the possible exception of the level of the rates themselves.

Two general approaches were advanced:

1. Calculate depreciation on the current dollar cost equivalent of the investment instead of on the original cost basis.

2. Reform the mechanics of present methods of figuring allowances, but within the historical original cost framework.

Under the first approach, reinvestment depreciation gets wide support. It works like this: When depreciable property is disposed of or otherwise retired, you figure the current dollars needed to replace the asset by referring to a price index. In effect, the difference between original cost and the cost in current dollars would be allowed as a tax deduction if you make capital expenditures.

Under the second approach, one method classifies depreciable property by useful lives in ten or fifteen age brackets. Most equipment could be written off in five to ten years. Another method would allow a triple-rate declining balance system instead of the present double rate.

Both approaches are reasonable, but the point is this: There were about as many pet variations on the basic depreciation systems as there were experts at the forum. If even the experts can't agree (the majority of the nation's tax authorities were there), how can industry expect Congress to remedy the situation?

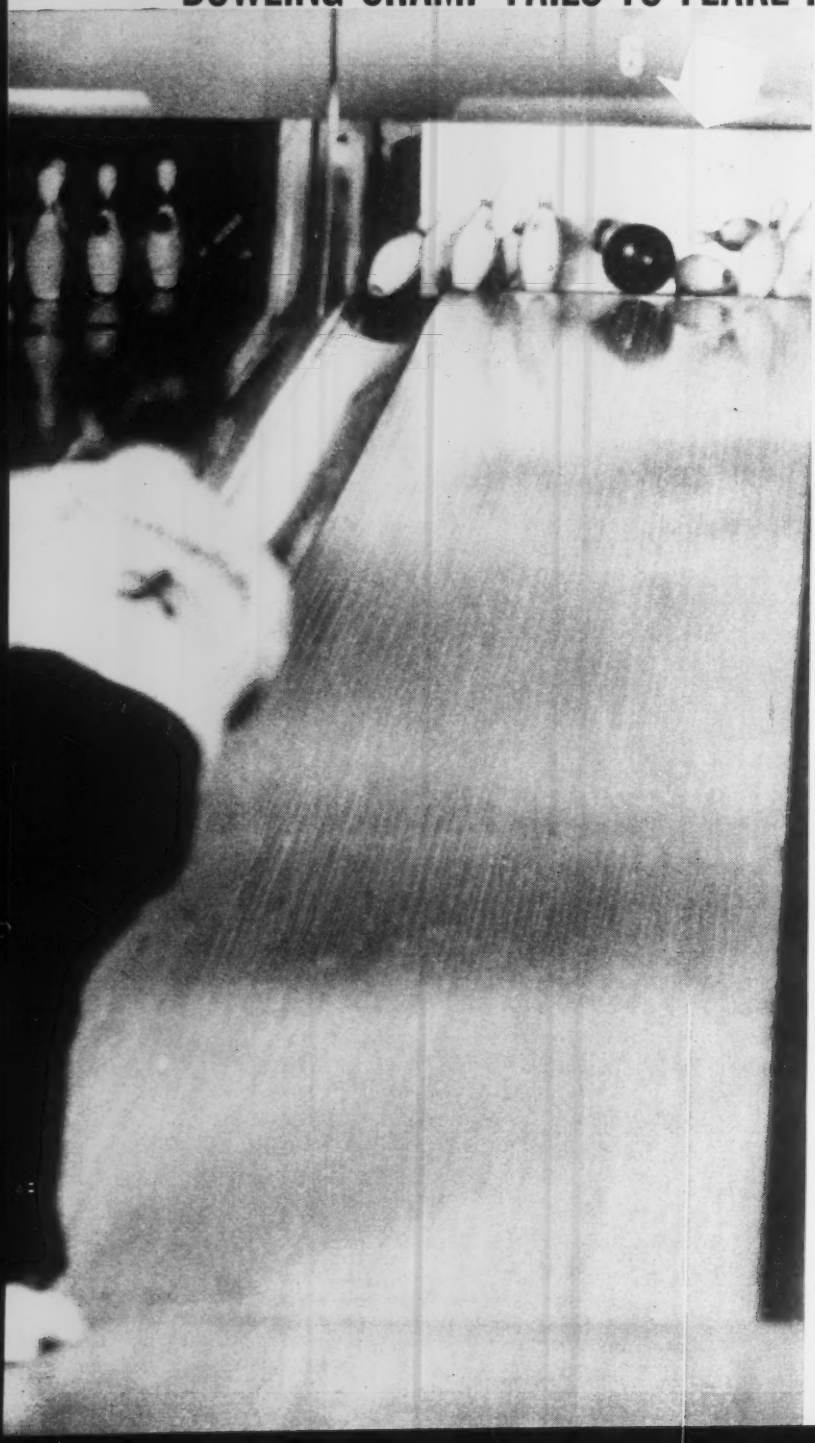
We think the time has come for industry to consolidate its forces, so it can present a unified front to the next session of Congress.

Irwin H. Such

EDITOR-IN-CHIEF

Three-time ABC winner, famous bowler BILL LILLARD slams in strike after strike sending ball and pins flying against piece of TI-CO set up in pit. Close up examination by Bill shows plenty of punishment but no flaking. TI-CO's zinc coating rolled with the punch!

BOWLING CHAMP FAILS TO FLAKE INLAND TI-CO®!



Switch to **TI-CO** Non-Flaking Galvanized saves manufacturers up to 15% in Production Costs.

A well-known garage door manufacturer dispensed with plating operations—reduced costs 10%. A leading furnace manufacturer saved $20 per thousand parts produced by eliminating cleaning and painting. A company making roller gravity conveyors cut out similar operations. These are just a few of many case histories of manufacturers who realized important savings and improved their product when they started using TI-CO Galvanized Sheets.

Whenever a product requires the strength of steel, plus corrosion resistance, Inland TI-CO is the most satisfactory . . . the most practical . . . the most economical material to use. That's because TI-CO is produced with a zinc coating that will not flake even under the toughest conditions. The coating stretches with the base metal during fabrication. Deep drawing, brake or roll forming, crimping, stamping, lock-seaming even severe spin-drawing . . . TI-CO takes them all in stride with no flaking or peeling. With TI-CO there's no need for costly dipping or touching up. And the uniform, bright spangled finish adds to the over-all attractiveness of the product.

If you're manufacturing or designing a metal product that requires corrosion resistance, consider TI-CO Galvanized Sheets. Manufactured in coils or cut lengths up to 60" widths, gauges 8 to 30 inclusive. Consult your local steel distributor or Inland sales representative. Write today for a free informative booklet on TI-CO.

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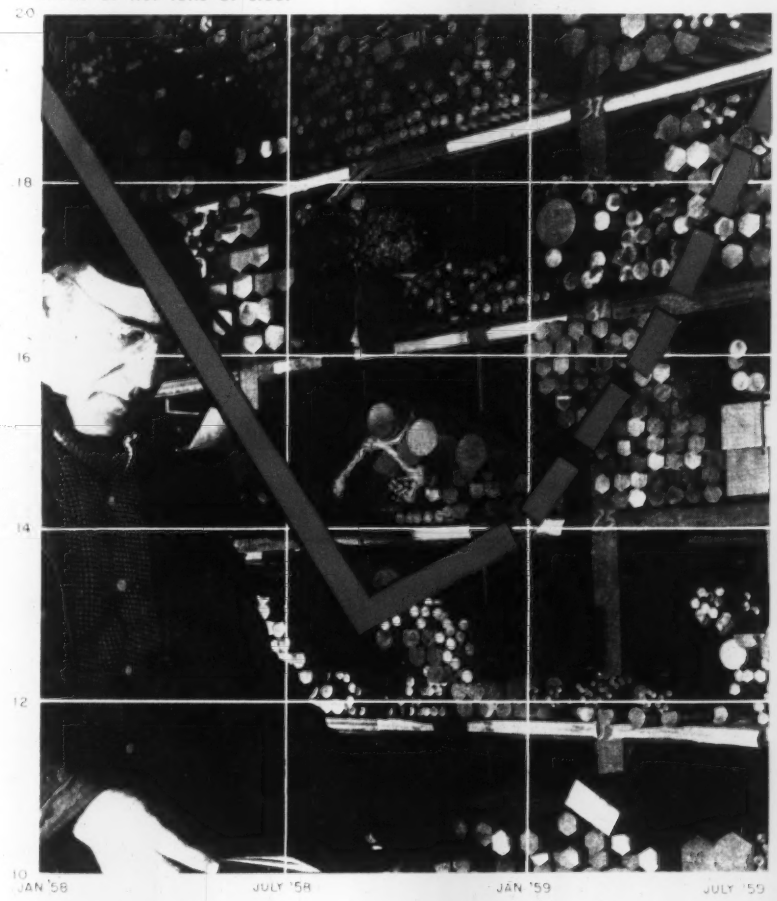


Steel Inventory Trend Line To Climb Steadily in '59

It is expected to reach 14 million tons by yearend, 16 million tons in the first quarter of '59, 19 million tons in the second quarter. Liquidation ended in August

STEEL INVENTORIES are on the uptrend even though many consumers are trying to keep their stocks at a minimum.

By the end of the year, producers and fabricators will have 14 million tons of steel in their stockpiles —1 million more than they had at the August low point, but 5 million less than on Dec. 31, 1957.

During the first half of 1959, they'll add 5 million tons to their inventories—2 million in the first quarter and 3 million in the second.

• **Contrast with '58**—During the first eight months, consumers reduced their stocks by 6 million tons. "The business executive realized that leadtime had evaporated," says F. Russell Widmer, commercial research director of Republic Steel Corp. "He could secure materials on an overnight basis. He was producing for an expanding market but found a declining market. The reaction was instantaneous and simultaneous. Thousands of fists were banged on an equal number of desks with the orders: 'Don't buy another damned thing!'"

Liquidation ended in August, when stocks fell to the minimum working level—about 13 million tons. September was a month of inventory stability, despite a moderate buildup in the automotive industry. Steelmakers shipped 5.9 tons of steel to the automakers for every motor vehicle (car, truck, or bus) they assembled. In the first seven months, shipments didn't exceed 1.89 tons per vehicle. (About 2 tons are required to make each unit.)

• **October Upturn**—Consumers began to replenish their inventories in October, and the rate of growth was accelerated by unusual circumstances: 1. Autoworkers left their jobs over local grievances, halting production and causing stockpiles to back up. 2. Tin plate users bought heavily in anticipation of a Nov. 1 price increase. Many appliance makers also abandoned hand-to-mouth purchasing as retail sales improved. Commercial research men at one mill estimate that finished steel stocks increased by 700,000 tons in October alone.

"The October buildup doesn't reflect a general reversal of inventory policy," a marketing expert comments, "but there's little doubt that the corner has been turned." How much steel will be added to inventories during the fourth quarter? Industry estimates run from 500,000 to 1.2 million tons. Those who suggest the smaller figure argue that production and consumption are pretty well balanced at a 75 per cent operating rate.

Today's level is about 13.75 million tons, and consumers' stocks of almost all products are considered low. Oil drillers may still be over-

loaded with specialties, but they're running short of the bread-and-butter items (5½ and 7 in. OD tubing and casing). Structural fabricators have cut their inventories of plates and shapes to the bone. In many cases, they put off buying steel until they're awarded a job and can order from the bill of materials. Even standard rail stocks are probably low in terms of track laying plans for 1959 and the carriers' improved earning prospects. Inventories of steel service centers are in good shape (above 3.3 million tons), says the American Steel Warehouse Association. Since the first of the year, they've been reduced about 10 per cent.

• **Outlook for '59**—The threat of a steel strike may cause consumers to beef up their stocks next year, but some market analysts foresee less of a scramble than usual. Says Mr. Widmer: "Steel capacity is expected to be 146 million tons. There is no probability of shortages even at seasonal peaks of demand. Even the possibility of a steel strike in the third quarter and the protection inventory consumers will accumulate should not unduly lengthen delivery times.

"Unlike the periods of recovery following recessions of 1949 and 1954, next year should see inventories accumulate only as required by a slowly increasing demand for end items, with a little extra for strike protection."

In deciding how much to buy and how soon, consumers will be influenced by three considerations: 1. The steel industry's increased capacity. 2. The possibility of a strike. 3. Their own business prospects. Although some mills think their customers won't hedge as much in 1959 as in prior years, others expect no departure from tradition.

"We just can't move from 75 to 100 per cent of capacity overnight," warns a leading producer. "Even if we had 200 million tons of capacity, there would be a period when the customer who had been getting overnight delivery would have to settle for delivery in two or three weeks. With just one bottleneck, all hell can break loose in a manufacturing plant.

"What purchasing agent wants to risk that?"

Where Is All the Wire Coming from?

(Short tons)

	West Germany	Netherlands	Belgium & Luxembourg	Others
BARBED WIRE				
1957	20,501	3,949	35,293	3,366
1952	4,666	11	19,926	1,649
WOVEN WIRE FENCE & FENCING WIRE				
1957	5,029	*	22,476	2,652
1952	49	*	1,462	86
WIRE NAILS & STAPLES				
		Japan		
1957	28,642	21,578	36,460	48,149
1952	3,115	374	4,669	9,365

*Included with others.
Source: Commerce Department.

U.S. Wire Mills Want Help

FOUR U. S. WIRE producers (Atlantic Steel Co., Continental Steel Corp., Keystone Steel & Wire Co., and Northwestern Steel & Wire Co.) have filed with the Tariff Commission for an investigation of damage being done to their industry by imports.

The four mills accounted for 34 per cent of the barbed wire, 24 per cent of the wire nails, and 30 per cent of the woven wire fence shipped by the U. S. steel industry in 1957.

• **Dark Future**—In 1947, imports of those products were under 100 tons. In 1957, they hit 228,073 tons. Domestic shipments fell from 1.5 million tons in 1947 to under 750,000 tons in 1957.

Edwin Martin, counsel for the mills, adds that prices of imports are so low that large quantities are entering midwestern markets. With the completion of the St. Lawrence Seaway, domestic producers fear further inroads into their markets. "At least one large manufacturer has ceased marketing barbed wire and another has almost reached that point," notes the application.

Mill spokesmen also charge that many importers represent their products as "made to U. S. specifications," or as being the same types made under U. S. brand names.

Such practices, say the mills, cost the U. S. 4.75 million manhours of labor (or about $14 million in wages) in 1957.

• **Tariff or Quotas?**—To partially meet lower prices of imported products, domestic producers are asking for increased tariffs. The aim: Hold the advantage over domestic prices at principal ports of entry to $10 a short ton. The mills don't say what quotas would satisfy them should the commission turn down higher tariffs.

Present duties: Barbed wire is free; 0.25 cent per pound on galvanized fence and fencing wire; 0.2 cent per pound on Class A nails; 0.5 cent per pound on Class B nails; 1.25 cents per pound on Class C nails.

Will Steel Case Go to High Court?

COMPANIES planning to grow through acquisitions are closely scrutinizing their chances to get "marriage licenses." Go-ahead signs from the federal government will be increasingly hard to get because the U. S. has thus far stopped the Bethlehem-Youngstown merger.

Last week, Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. were still undecided about whether to appeal Judge Weinfeld's decision. If they don't appeal, a big damper goes on other contemplated mergers. If they do appeal, industry will mark time until the final decision.

• **Huge Campaign**—Judge Weinfeld's decision is a big victory for the Justice Department, now conducting a vigorous antimerger drive; it has eight major antitrust cases in various stages of litigation. And the Federal Trade Commission is handling more merger cases this year than ever before.

• **Precedent**—If the case is appealed and if the Supreme Court upholds Judge Weinfeld, the U. S. will have a more powerful weapon in Section 7 of the Clayton Act, which prohibits corporate acquisitions when the effect would be to "substantially lessen competition or tend to create a monopoly." How potent the weapon will be depends on the scope of the high court's opinion.

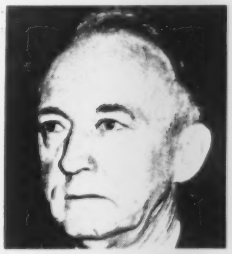
• **The Timetable**—If there is an appeal, lawyers expect the Supreme Court to rule by late '59 or early '60. The steel companies have 60 days to appeal to the high tribunal. Then both sides are allowed 170 days to file notices, records, and motions. That will take almost until June, when the court adjourns until October.

• **Homer's Views** — Arthur B. Homer, Bethlehem's president, contends that the merger would heighten, rather than lessen, competition. He says the marriage would introduce a strong, new, competitive force in the Midwest since Bethlehem would add substantial steelmaking and finishing capacity at both of Youngstown's plants.

Bethlehem, Youngstown still debating whether to appeal Weinfeld decision. Big factor is that court voted 4 to 2 in '57 against DuPont-GM tie. Here are justices' backgrounds

Chief Justice Earl Warren

A California Republican appointed by Eisenhower, he voted with the majority in the Du Pont case.



Hugo L. Black

An Alabama Democrat appointed by Roosevelt, he voted with the majority in the Du Pont case and is considered by court observers to be generally opposed to mergers.

Felix Frankfurter

A Roosevelt-appointed Democrat from Massachusetts, he is the only man on the present court who voted in favor of Du Pont.[1] But court observers say he tends to refuse to reverse the decision of a lower court.

William O. Douglas

This Washington Democrat and Roosevelt appointee voted with the majority in the Du Pont case and is generally opposed to mergers, observers say.

Tom C. Clark

Texan, Democrat, and Truman appointee, he didn't vote in the Du Pont case.

John M. Harlan

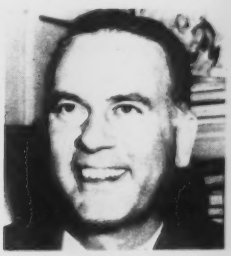
This New York Republican appointed by Eisenhower is generally regarded as a moderate.

William J. Brennan

From New Jersey, he is the only Democrat appointed by Ike. He wrote the majority opinion in the Du Pont case.

Charles Whittaker

A Mississippi Republican and Ike appointee, he has considerable experience as a corporation lawyer, is generally considered a conservative.



Potter Stewart

An Ohio Republican appointed by Ike, he is considered a conservative who would not reverse the decision of a lower court except under extreme circumstances.

1. Justice Burton, who recently resigned, was the other.

Breakeven Point: Route to Better Decision Making

EVERYDAY DECISIONS have a tremendous effect on profits. If you're looking for a better basis on which to make them, E. A. Cyrol, Chicago management consultant, suggests an approach that has paid off for his clients:

• **What It Is**—It's the breakeven point concept yanked out of the ivory tower and put to work on the shop floor. It's fast and fairly simple. You can control the degree of accuracy. It's not a strict formula. Rather, it's a way of thinking that can make you more important to your company. It can be used in production, purchasing, marketing, and many other areas. Mr. Cyrol says it is a way to "find cost relationships ahead of time."

It's not revolutionary; you may subconsciously use it now. But close adherence to the principles involved will sharpen your judgment, help you justify your decisions, and bolster your reputation as a manager.

For example, with the economy snapping back now, your production may be picking up and you want to rehire some men in your department. You can use this concept to determine how many you need and prove it to the boss.

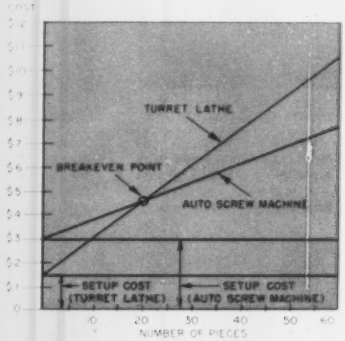
Or you can use it to justify the purchase of a new piece of equipment—if that machine would honestly pay for itself (this approach will let you determine that, too).

Or, if you're a purchasing agent, this is a good approach to make or buy decisions.

Mr. Cyrol is explaining the concept at regional meetings of the National Metal Trades Association.

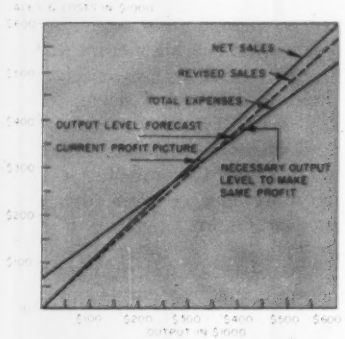
• **Example No. 1**—The concept can be effectively used on any management level. Suppose you are the production manager of a machine shop. You want to know whether it would be cheaper to machine a small lot on a turret lathe or an automatic screw machine. Say the setup cost is $3 for the automatic and $1.50 for the turret lathe. That's your starting point. Then compute other important costs (tooling, amortization, direct labor, fringe benefits, and any other significant cost that varies between the two methods). Say that figures out to $4.80 an hour for the turret lathe and $4.60 an hour for the automatic (although other costs are higher on the automatic, direct labor is lower because one operator runs several machines—four in this example).

Say machining time per piece is 1 minute on the screw machine and 1.9 minutes on the lathe. That means cost per piece is 15.2 cents for the lathe and 7.7 cents for the automatic. Graphically, it would look like the chart below. It instantly shows you which machine to use, depending upon the length of run. A 30-piece lot, for example, would be cheaper to run on the automatic.

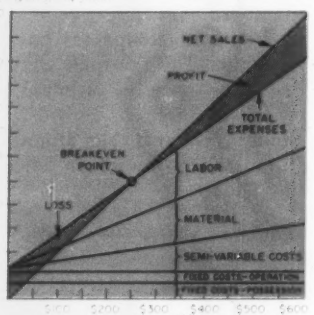


• **Example No. 2**—Suppose you are thinking about lowering your selling price on one product. Your market research director tells you that a 5 per cent price reduction would boost sales about 20 per cent; the current annual sales rate for the item is $320,000. Would the price cut pay off? Not in this case (see chart). Sales would have to reach $400,000 under the new price structure before profits would equal those at the $320,000 sales level with old prices.

E. A. CYROL



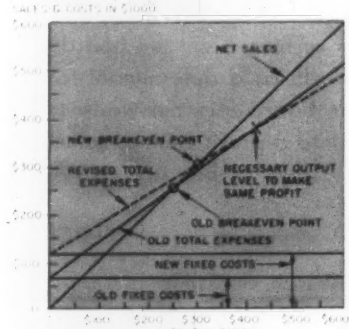
• **Example No. 3**—Here's how a breakeven chart is set up (below). Note that profit per sales dollar should grow larger as sales mount because you'll be spreading your fixed costs over a larger number of items.



• **Example No. 4**—If you buy new equipment to both expand capacity and lower unit manufacturing costs,

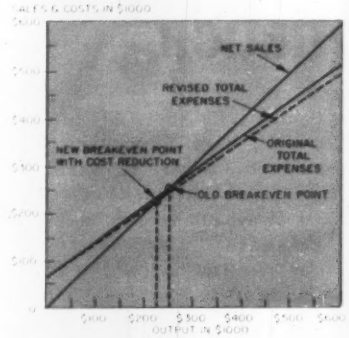
you'll change that picture (chart, Example 3) to look like the chart below.

The added capitalization increases fixed costs, so your breakeven point moves to the right. Now net sales will have to exceed $400,000 before profit per sales dollar will equal what it was before the expansion. However, if sales hit, say $500,000, your profit per sales dollar is greater due to the new equipment.



• **Example No. 5**—Trimming labor costs is probably the most effective way to lower your breakeven point.

It is equally effective in widening your cone of profit:



• **Train Yourself**—Use this concept as a guide to sharpen your decisions. On minor matters, you can visualize the problem. For major decisions, it's worthwhile to use the formal procedure (compute all costs and draw a chart). One big advantage of this approach is its flexibility: You can figure costs down to the penny or use estimates—depending on the scope of the problem.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Plastics Buck the Recession

Year	Production Synthetic Plastic, Resin Materials
1958*	2.2 million tons
1957	2.1 million
1956	1.9 million
1955	1.8 million
1954	1.4 million
1950	1.0 million

Source: Society of the Plastics Industry Inc.
*Estimated

METALWORKERS who used to deride plastics are finding they can't get away from the synthetic. It represents a market, a way to diversify, and is often a tool to be used in improving their products.

An equipment builder attending the National Plastic Exposition in Chicago describes the material's importance to metalworking this way: "It's a tough, top quality competitor in many applications. For equipment builders, it's a growing market. For others it offers opportunities for cost cutting, product improvement, and diversification."

Equipment builders watched many of their metalworking markets shrivel this year, but sales of machines for the plastic industry were active.

• **Examples**—Logan Hydraulics Inc., a subsidiary of Logan Engineering Co., reports sales are 15 per cent higher than last year's. The Plastics Div. of Fellows Gear Shaper Co. says its sales will equal last year's.

Hydraulic Press Mfg. Co. says 50 per cent of its over-all volume goes into plastics. To date its sales are 15 per cent ahead of last year's.

This year, National Automatic Tool Co. Inc. introduced a new injection molding machine which features a shockless hydraulic system. Officials feel the line will soon provide a "substantial" percentage of over-all company sales.

• **Where It's Used**—Strictly speaking, there is no such thing as a plastics industry. It's more a foster child to other industries. Equipment builders say more than half their sales go to captive operations.

Eleven basic types of plastics are used; each has its own properties.

About 30 million lb of reinforced plastics will be used in construction this year. B. F. Goodrich Chemical Co. has developed a new type of plastic-coated aluminum aimed at the home building market.

Auto and appliance makers are using more plastics. Stewart-Warner Corp. set up an injection molding department and lopped 40 per cent off the cost of making odometer dials—about 10 million annually.

The Naugatuck Chemical Div., U. S. Rubber Co., has a process for continuously laminating sheet vinyl to steel. Production this year will hit 25 million sq ft, officials estimate, and by 1960 should top 100 million sq ft annually. Applications include auto parts, TV cabinets, luggage, and furniture.

About 10 per cent of this year's output of plastics will go into packaging.

• **Drawback**—Relatively low resistance to heat has been one of the chief limitations of plastics. H. E. Humphreys Jr., chairman, U. S. Rubber, predicts early development of plastics withstanding 1000 to 1500 F.

Industry Prepares Three Plans of Attack

AIRCRAFT INDUSTRIES ASSOCIATION TACTICS:

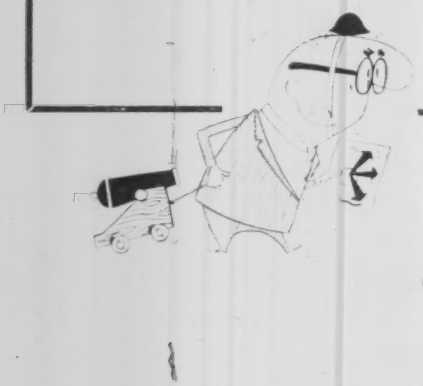
Seek to negate industry loss of incentive profits by amending the act so that a certain amount of a company's earnings cannot be touched by the board. Win the right to appeal as far as the U. S. Court of Appeals.

MAPI TACTICS:

Amend the act so that it applies only to top defense contractors making most of their money from the government. The object: Protect smaller firms making barely enough money to qualify them as subject to renegotiation.

NSIA TACTICS:

Kill the act. Short of that, blunt the board's emphasis on net worth as a determinant for excess profits. The board uses net worth to turn renegotiation into a profit ceiling, something it wasn't intended to be, says NSIA.



Lack of Unity May Stall Foes of Renegotiation

DEFENSE CONTRACTORS will have their first real opportunity to challenge renegotiation when the next Congress convenes, but don't look for a co-ordinated attack—a shortcoming that hurt industry's campaign for depreciation reform during the last session.

The 85th Congress extended the law for only six months—it expires on June 30, 1959. Previous Congressional hearings on the subject (since the Korean War) have been little more than skirmishes. Renegotiation was expected to survive without change. But the situation could be different this time.

Companies will soon be approached by the Joint Internal Revenue Taxation Committee. Big associations are preparing Madison Avenue pitches for the Ways & Means and Finance committees.

But some Washington observers aren't too optimistic because the defense contractors are not setting up a concerted, all-out attack. Most of them merely plan to snipe at certain phases of renegotiation, and they don't even agree on how to do that. Renegotiation could get through the next session practically untouched.

Here are some of the pet programs:

• **Aircraft**—The industry with the biggest stake will be represented by the Aircraft Industries Association, which has no intention of asking that the act be killed. Instead, its blows will be concentrated against loss of incentive profits.

Several types of defense contracts allow the contractor to keep up to 20 per cent of the profits gained through increased efficiency. The Renegotiation Board won't allow industry to keep the money, says the AIA, because it uses an annual accounting basis, rather than a contract basis, when it examines a firm. "Only windfalls should be taken away, not incentives," argues a spokesman.

The association will offer an amendment to the act which essentially will shift the burden of proof from the company to the board. It will ask that a certain amount (probably 8 to 10 per cent) of a company's earnings which are above those originally conceived in the contract be regarded as untouchable by the board.

"This," says AIA, "is simply asking for a certain amount of flexibility in the profit picture. If we get that, then we are willing to fight with the board about the other 90 per cent." The amendment would apply to all contracts, not just those with incentive clauses.

AIA doesn't want renegotiation killed because many of its members

haven't had their profits cleared by the board since 1954. To kill the act without amendment would permit the board to renegotiate five years of contracts (1954-58) on the old basis.

AIA is dropping part of the approach that Rep. Cecil King (D., Calif.) offered at the last session. He wanted the cases conducted on a courtlike basis with an open record. AIA feels it can build a sufficient record in appeals to the U. S. Tax Court. It does want the right to appeal to the U. S. Court of Appeals (the House agreed to it, but the Senate didn't).

• **Equipment Makers** — The Machinery & Allied Products Institute is concerned about the board's power to hit a firm when it makes barely enough profit to put it over the $1 million floor. Where there is a loss, notes a spokesman for MAPI, the statute is clear, but "inadequate" profits are not defined to give the company a break. "If profits jump from extreme low to high, the board takes the average. But the low profits don't balance the high ones because a company is supposed to make some money in our system."

• **Electronics**—MAPI is also looking ahead at the electronics industry. Large firms have had experience with renegotiation and know their way around, but "cold war babies of the new era of military technology, which have grown up on government research contracts, are going to be hit." Smaller companies also have a larger burden to carry because their profits-to-sales percentage may run higher than larger firms'. Renegotiation should be confined to top defense contractors making most of their money from the government, believes this MAPI source.

• **Net Worth**—The National Security Industrial Association flatly states: "In view of the price revision techniques available, such as redetermination and incentive contracts, the armed services need no help from the Renegotiation Board." Short of the law's death, NSIA wants to blunt the emphasis on net worth as a determinant for excess profits.

"It should be treated as an initial indicator, not a statutory factor," notes one source. The board uses the net worth formula to turn renegotiation into a profit ceiling, something it was never intended to be, argues NSIA. The Senate Finance Committee said in 1951: "Return on net worth might not in many cases be an adequate measure of profits."

NSIA claims the board's emphasis on net worth encourages inefficient contractors, fails to adequately measure one industry against another (because net worth varies greatly from one to another), does not take into account replacement costs, de-emphasizes the risk an advanced weapon contractor may take (where another making a standard military item takes little risk), and fails to measure a firm's total contribution to the defense effort.

• **Warning: Danger**—One association spokesman says his own group is divided on what to do about renegotiation. Some member firms even suggest returning to the Vinson-Trammel Act, which allowed only a flat percentage profit on defense business. Others feel renegotiation gives them a clean bill of health and they needn't worry about Congressional investigations.

A government informant calls industry's unwillingness to create a solid front "little short of ridiculous." He adds: "Any arguments for renegotiation can only be based on the assumption that something worse could happen to industry. I'm not sure that is possible."

A trade group spokesman thinks MAPI's warning that more small companies will soon be involved is well taken. "It involves all industry in the new age of technology," he says, "because any company worth its salt is getting a share of government work to stay up with its competitors." His own members, he adds, remain largely "disinterested" in renegotiation reform.

• **Too Sophisticated** — "The large firms have become too sophisticated about renegotiation," charges another. With special accounting systems, they can write off costs that would be difficult for smaller companies to justify. They also have staffs trained for renegotiation work (which they write off as proper costs), thus tending to allow themselves to think they are making out as well as they can." One of the two points of view seems to rule their contact with the Renegotiation Board: 1. "To hell with them; we won't tell them anything. Let them do their worst." 2. "We lean over backwards to co-operate with the board, so they will give us a break."

The to-hell-with-them attitude pushes the board into acts it wouldn't consider if industry faced up to the problems of renegotiation and attacked them in Congress. (The board's reliance on net worth is a result of that attitude, believes a Capitol Hill source.)

The let-them-do-their-worst attitude allows the board to obtain product-by-product cost data on government and nongovernment business. (It is believed by some sources that the board's attention to nongovernment work is illegal, but where a contractor can show some losses, he tends to get better treatment, so many firms go along with the request.)

• **Personnel Problems**—Here's industry's real dilemma, in the opinion of one spokesman: "The board's personnel are not up to their job." He asks: "Can the board, with its unfavorable quarters (in a war-built temporary building) and relatively low salaries, command the type man who has the knowledge to judge whether North American should make $10 million or $20 million in one year?"

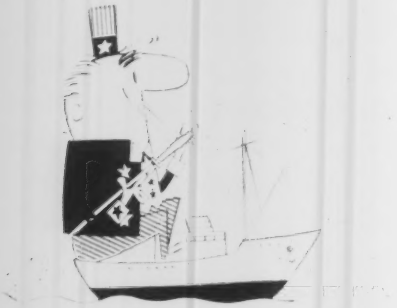
Most sources agree that board personnel are honest, but usually add "mediocre." If industry should demand better talent from the board, it would also have to ask for extension of the act on a permanent basis. Government agencies with a life expectancy of six months to two years cannot find the best people.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

New Shipwork Load Down

Contracts for four new merchant vessels, the first since last March, were made with U. S. shipbuilders last month, says the Shipbuilders Council of America.

Eighty-seven vessels (2,779,300 tons) are now under construction or on order, 11 ships (700,000 tons) less than a year ago.



Smooth Sailing for Shipbuilders?

"OUR merchant marine will continue to be subsidized as far as one can see ahead," notes Commerce Secretary Lewis Strauss. Coming from such a firm believer in the free enterprise system, the statement points up the plight of our shipbuilders, who will appeal to Congress next session for increased subsidies for U. S. shipping firms.

Sen. Warren Magnuson (D., Wash.) chairman of the Interstate & Foreign Commerce Committee, which guides subsidy bills through Congress, warned last week that competition from foreign yards, particularly Japan's, is stepping up. Backlogs of our shipbuilders are dropping, despite the plan to replace much of our merchant fleet in the next decade or so.

Ike's Plans May Mean Rough Waters

With all the federal agencies standing in line for more money, President Eisenhower's order to hold the line on spending is particularly serious for the Maritime Administration. It has just awarded the largest construction subsidy in history to Lykes Bros. Steamship Co. (almost 50 per cent of the cost of four ships). Future awards presumably will have to be cut back to stay within Ike's order.

Grading the agencies' chances for more money next session, you come up with this outlook for the maritime folks: They'll stand far back in the line now forming at the Budget Bureau's door.

Other Agencies Need Money, Too

Defense must be first in line because it accounts for half the federal budget. To stay below the $40.8 billion estimated for fiscal 1959, some tremendous cuts would have to be made in missile and space spending —a pretty sacred area so far. Foreign aid, which Congress sliced more than $650 million below Ike's original request, may get the same treatment in the new session, but administration sponsored loan programs (designed to make up for declining direct aid) will cut into those savings.

Two home front areas—agriculture and mining—will get close attention from the administration and Congress. With farm income scheduled to fall about 5 per cent next year, it would appear to be political suicide for the Republicans to try to hold down subsidies. The Interior Department is expected to revive the Seaton Plan for the mining interests. Congress will want to go farther than Ike plans in both areas.

Chances are strong for more housing money from Uncle Sam next year (up to $34 billion may be asked for).

You can see where shipbuilding subsidies are left. The fact that they can't be decreased (if we want to have a merchant marine) indicates how little our federal budget will be cut by Ike and how great the chances are for a whopping increase by Congress.

Support for 'Gas' Tax Is Lacking

The President will ask for a 1.5 cent a gallon increase in the gasoline tax to save the Federal Highway Trust Fund from sinking clear out of sight. The funds, in the red for the last four months, must get new revenue sources (like more gasoline taxes), or turn to Treasury's general funds if our road program is to stay on schedule.

But where is the support for higher taxes? Already, the American Automobile Association and the National Grange, two powerful groups, have stated they will not go along with Ike's request.

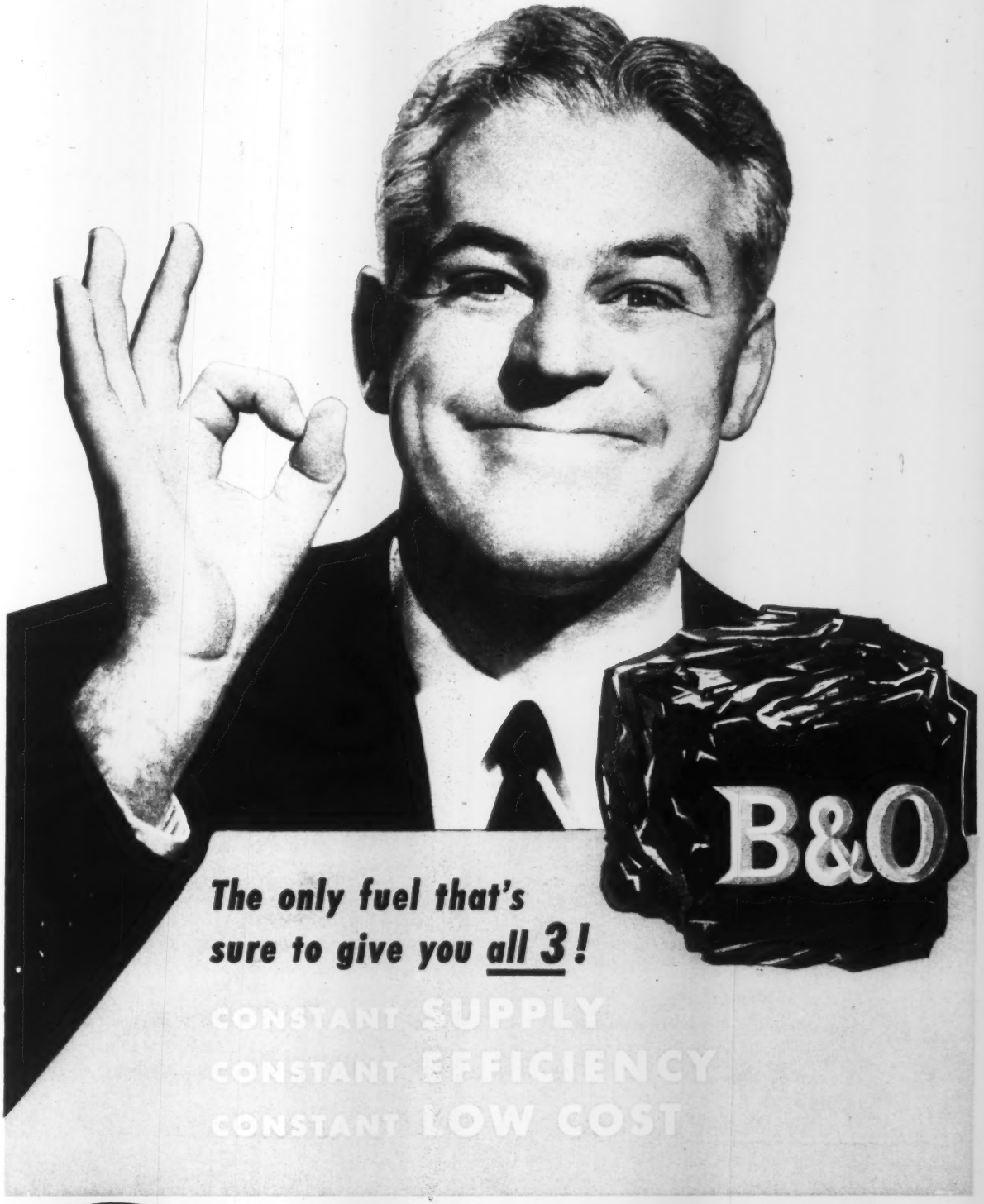
The 49 states can be expected to pressure their congressmen to avoid higher taxes. Gasoline taxes are a sure source of revenue for states, and they don't like the federal government taking too much of the pie. Maybe $1 billion will have to be authorized to highways next session as a stopgap until Congress can figure out a new formula for building them without hurting anyone's pocketbook.

Atomic Plane's Future Role Told

Maj. Gen. Donald Keirn, chief of the Air Force-Atomic Energy Commission program for developing the atomic plane (STEEL, Nov. 24, p. 60), made one of his rare public statements on its status last week. Coming at budgetmaking time in the Pentagon, it has special significance because of Ike's order to hold down spending. The general leaves no doubt as to his position on our need for a militarily useful plane: "An ideal manned aircraft system must carry a large payload and remain on nomadic patrol for extended periods in various areas of the world."

Progress report: The general claims radiation hazards are not as extreme as some scientists claim, that the A-plane will have the speed and altitude capability of a chemically powered plane by using chemical afterburners, and that more attention should be devoted to the hardware for such a ship, rather than confining research to materials only.

General Keirn concludes: "We are now on the threshold of success in various technological areas and will soon be ready to embark on an experimental flight development phase looking toward a prototype aircraft."



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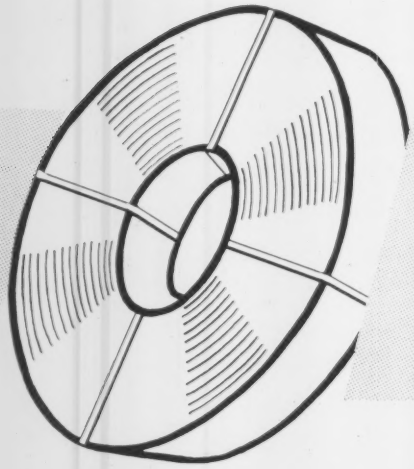

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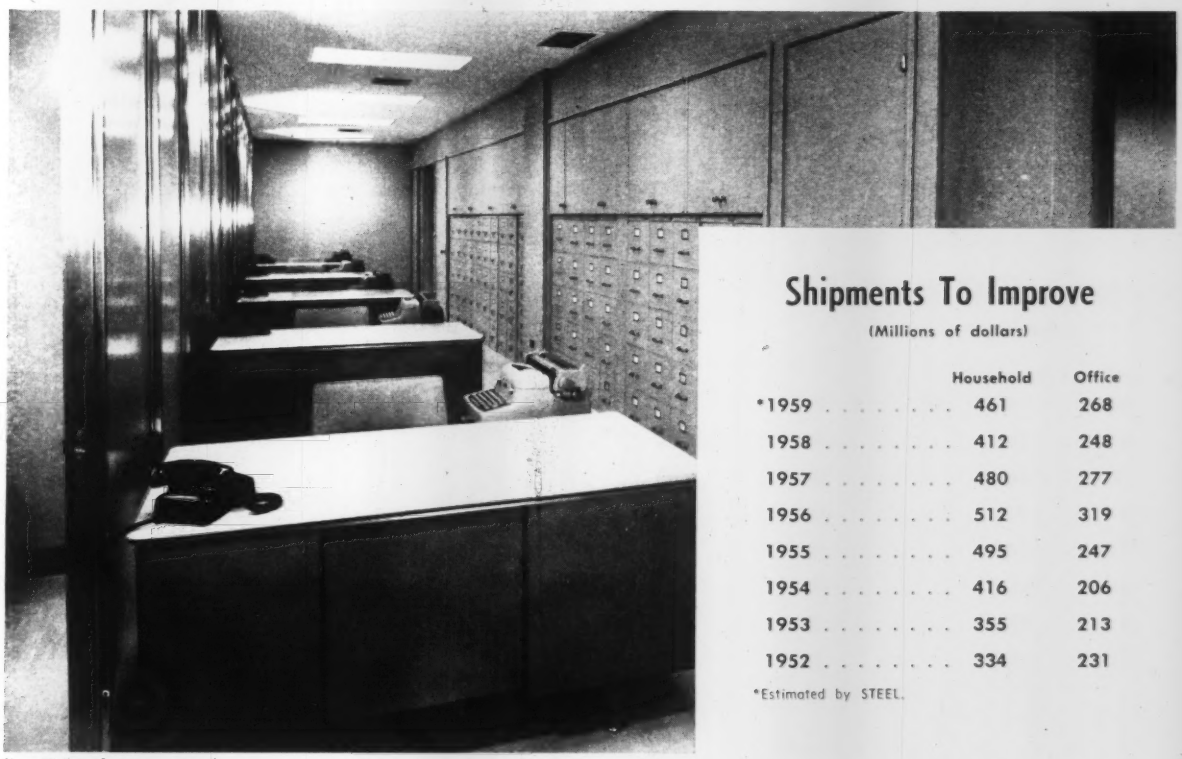

Shaw-Walker Co.

Shipments To Improve

(Millions of dollars)

	Household	Office
*1959	461	268
1958	412	248
1957	480	277
1956	512	319
1955	495	247
1954	416	206
1953	355	213
1952	334	231

*Estimated by STEEL.

Metal Furniture Men Hopeful

FORECAST: Metal furniture shipments in 1959 will exceed 1958's by some $69 million, but probably won't equal 1957 figures (see table).

Production of 1.5 million chairs, 775,000 desks, 1.6 million noninsulated filing units, and 75,000 insulated filing cabinets is included in manufacturers' plans for next year.

A STEEL survey of the industry shows that demand turned up slightly in the fourth quarter. Shipments through September were trailing last year's by about 20 per cent, but October volume moved a little ahead of the same month last year.

• **Prices**—Arthur R. Hedeman, vice president, Shaw-Walker Co., Muskegon, Mich., says: "Although there have been some slight adjustments, there have been few general price increases to cover higher steel and other costs. Competition has been one factor in this."

M. L. Levin, president, Business Equipment Corp., Boston, thinks the upward trend will continue through 1959. J. G. Whitrock, sales manager, Western Mfg. Co., Aurora, Ill., describes prices as "firmer than at any time in the past two years." He adds that no adverse reaction has been felt in the few spots where small price hikes were felt to be necessary this fall.

• **Materials**—More aluminum and fiber glass are being used in production of household metal furniture, reports Otto W. Molla, vice president, Molla Inc., Westbury, N. Y. A trend has also been noted toward knockdown construction for easier and more economical shipping and to standard fasteners for assembly, he adds.

Tubular steel, for the most part joined by welding and brazing, is the principal material used by Huron Chrome Products Co., Marion, Ind.

New products and design improvement should provide sales impetus in the next few months, predicts a spokesman for Security Steel Equipment Co., Avenel, N. J., but they're not expected to materially alter the ratio of metals used.

Dollar value of metal used in construction of office furniture is 4.3 times greater than the value of wood used in making comparable products. On the other hand, value of wood used for household furniture is three times that of metal in such applications.

The industry will consume about 680,000 tons of metal in 1959 (mostly steel) of which some 370,000 tons will go into home furniture. Close to 125,000 tons will be in the form of wire for upholstery spring coils and bedsprings.

About 310,000 tons of carbon steel, wrought iron, and castings will be needed next year. Aluminum mill shapes and castings will account for another 20,000 tons.

The Purchasing Executive of 1958

(Based on a STEEL survey of 200 purchasing men)

HIS EARNINGS . . .	(% of respondents)
Under $7500	17
$7500-$10,000	45
$10,000-$15,000	26
$15,000-$20,000	4
$20,000-$30,000	6
Over $30,000	2

HIS TITLE . . .	
Purchasing agent	73
Director of purchases	9
V.P.-purchasing	8
All others	10

HIS EDUCATION . . .	
No college	55
Some college	8
College graduate	37

HIS JOB BACKGROUND . . .	
Production	34
Accounting	18
Sales	11
Engineering	11
All others	26

Purchasing Directors Keep The Machines Running

THE PURCHASING DIRECTOR is a key member of the management team. Through his hands pass better than 50 per cent of his company's dollar outlays. How well he does his job directly affects his company's earnings. Any savings he makes show up as profit. Any misstep in purchasing is a direct loss to the company.

• **His Duties**—The top purchasing man is first of all a manager.

William H. Old, director of purchases for Babcock & Wilcox Co., New York, "looks at the forest instead of chopping down the trees" in his capacity of staff chief of B&W's purchasing operation. His responsibilities: Direct, co-ordinate, and standardize over-all policy; maintain good vender relations; supply management with special records and reports when it needs them; maintain liaison with other departments (he has authority to work with anyone in any division); establish policy and procedures of a company-wide nature; co-ordinate purchases when advantageous; and develop techniques to improve his function.

Richard N. Chapin, general purchasing agent for Air Reduction Co. Inc., New York, calls his job a line function. Besides supervising and co-ordinating purchasing, his daily routine brings him into direct contact with buying, vender analysis and selection, standardization, substitution, and value analysis, as well as training of buyers.

Rodney Plimpton, purchasing agent for Electro Dynamic Div., General Dynamics Corp., Bayonne, N. J., says he: "Supervises purchasing of all materials and services, sets purchasing policy, selects venders, hires and fires purchasing personnel, sits in on major management meetings, acts as chairman of the inventory control committee, and makes recommendations on make or buy decisions."

• **Who Is He?**—The purchasing chief is known by a variety of titles. Most common is still "purchasing agent" (see exhibit) but the trend is toward such titles as vice president-purchasing, director of purchasing, and manager of materials.

The average director is in the 50 to 55 age bracket. He has been with his company about nine years (STEEL's survey shows length of service varies from less than one year to 45 years). The majority of respondents became No. 1 men in purchasing within eight years after entering the field (28 per cent started at the top).

• **His Background**—Only 14 per cent of directors contacted by STEEL started their careers in purchasing. The survey uncovered 16 previous occupations (see exhibit).

Fewer than half of those surveyed have college degrees. You can look for that to change in another ten years. Most younger men taking over departments are university trained.

Engineering is becoming increasingly popular as a training ground.

In STEEL's survey, engineers in purchasing were topped only by men holding sheepskins in business administration.

• **His Qualifications**—Every purchasing executive has his own pet list of the personal and professional qualifications that make a topnotch director. Probably at the top of everyone's list is inquisitiveness or imagination—continually striving to improve purchasing's effectiveness. Right alongside is integrity—the ability to withstand pressures from inside as well as outside.

Professionally, the purchasing director must be intimately acquainted with market conditions, price trends, suppliers, and all the mechanics of efficient purchasing (everything from automated order systems to tools like value analysis). Says Howard Ahl, executive secretary of the National Association of Purchasing Agents: "The purchasing director should know what's going on in the plant and understand the problems of production and engineering."

• **His Salary**—Salaries (see Page 48) are on the rise but in many cases they are still not on a par with those of men holding comparable titles. Sales of most firms surveyed by STEEL range between $1 million and $20 million. There is little correlation between the purchasing man's salary and his company's business volume: A man in a company doing $5 million often makes more than his counterpart in a firm doing $10 million. One reason: Many firms have no yardsticks for measuring purchasing's worth. Over the $20 million mark, salaries begin to become more closely allied with sales. College graduates normally make out better than men without degrees.

Companies with sales in excess of $100 million generally pay their purchasing directors at least $25,000. A few make over $100,000 and at least one is in the plus $350,000 range.

• **His Attitude**—The purchasing director likes his job. He knows a real challenge exists in getting maximum benefit out of his operation.

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Profile of a Purchasing Man

DAVID L. GIBSON is typical of the nontypical modern purchasing executives who have revolutionized the concept of that field in the last ten years. He bears little resemblance to his counterpart of pre-World War II days who merely "filled someone else's requisition."

"He lives, breathes, eats, and thinks purchasing," says his opposite number in another metalworking company.

That is important when you're vice president of purchases for a multiplant company like Worthington Corp., Harrison, N. J. It has more than 10,000 employees and did $190 million worth of business last year in such diverse items as pumps and compressors, air conditioning equipment, diesel engines and steam turbines, motors and generators, valves, and instruments.

• **RESPONSIBILITIES**—Under Worthington's decentralized purchasing setup (each plant handles its own buying rather than having it done on a central corporate basis), Mr. Gibson functions in a staff rather than a line capacity. His 1001 duties include: Develop and interpret purchasing policies and procedures, negotiate company-wide purchase agreements, advise plant purchasing managers, negotiate large real estate transactions, assist in training purchasing personnel, advise on inventories, function as corporate traffic chief.

• **LONG HOURS**—His workday doesn't stop at 5 p.m. Like many other metalworking executives, he uses the evening hours for cleaning up details, business reading, writing, speaking engagements, and plain thinking. It adds up to an average workday of 12 hours.

• **EXPERIENCE**—How do you get to be a purchasing executive? For David Gibson, it started with a major in mechanical engineering at Rutgers University (class of 1924). He joined Worthington right after graduation. For 27 years, he "prepped" for purchasing—first as a student engineer, then as a salesman, merchandising sales manager, manager of priorities, and executive secretary of the war contracts termination committee. In 1951, he officially joined the purchasing family as assistant to the vice president-purchases. He later rose to general manager of purchases and, on May 1 of this year, to vice president-purchases.

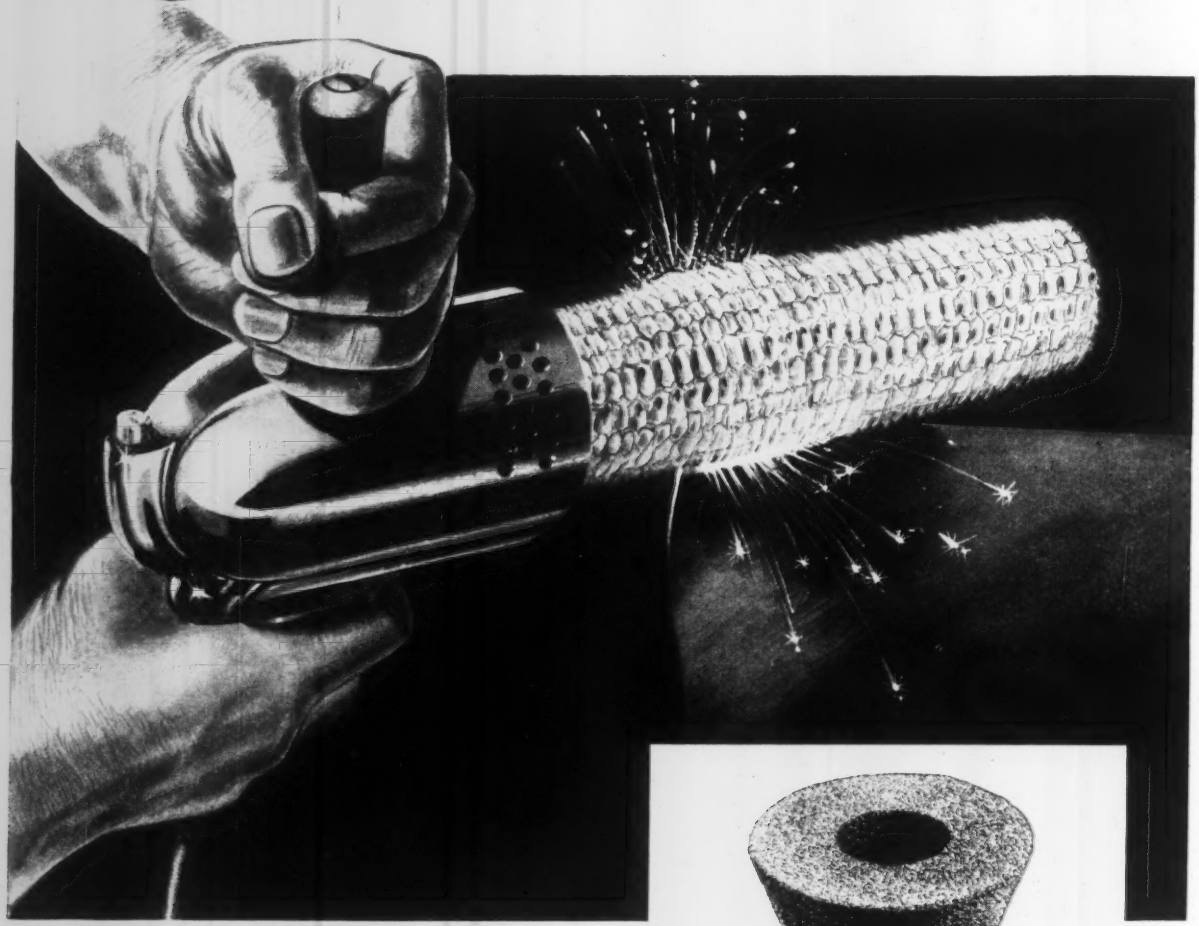
• **PHILOSOPHY**—Mr. Gibson feels a purchasing man should not spread himself too thin. "I can't subscribe completely to the materials manager concept when so many things remain to be done in effective purchasing itself. (Examples: Negotiation, vender selection, standardization, substitution.)"

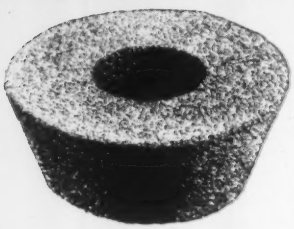
Purchasing doesn't have to be a dead end street, believes Mr. Gibson. "A man with the right background, training, and drive has the opportunity to go to the top in purchasing and then possibly higher into company management."

He has a line of successors trained if the need ever arises. "In every job I have held, there were at least three men back of me qualified to move up the ladder. A man can't advance in purchasing (or any other job) unless he has trained the men under him to be ready for a bigger job."

• **TARGET**—"Purchasing's biggest job today is to show it is more than a service function. We have to prove to management that purchasing has a place in the company's profit picture."

US RUBBER GRINDING WHEELS





Inset shows actual U. S. Lo-Temp Cup Wheel.

Grinding with a corn cob?

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Greater wheel porosity, thereby preventing the wheel from burning the metal, even at top speeds • greater uniformity within the wheel – and from one wheel to another • greater strength and resistance to wear, therefore, longer life and wheel economy • greater resistance to centrifugal stress.

As any grinding wheel operator will quickly discover, this amazing new "corn-fed" U. S. Lo-Temp Cup Wheel permits him to do a more craftsmanlike job more quickly, more surely, more safely.

The U. S. Lo-Temp is just one of several new grinding wheel developments coming from U. S. Rubber. Get in touch with wheel specialists through U. S. Rubber, 312 N. Hill St., Mishawaka, Indiana, your local "U. S." District office, or by writing us at address below.

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At Chevrolet's 1959 press review, General Manager Edward N. Cole remarked: "Many owners spend a lot of time trying to take some of the pesky little bugs out of their new cars. In fulfilling its responsibility to owners, Chevrolet has assigned two 'squeak and rattle' engineers to track down and eliminate these petty annoyances."

Richard P. James, senior experimental engineer, and William E. Hart of Chevrolet's engineering center are the two sharp-eared gentlemen who drew the unusual assignment.

MR. HART

MR. JAMES

Shhh! Chevy Noise Patrol at Work!

EVER BUY a new car and two weeks later find yourself arguing with the dealer because he can't find and correct half a dozen little squeaks and rattles? If this hasn't happened to you, you're either easy to please or extremely lucky.

Theoretically, every car Detroit turns out should be design perfect. It is easy for design engineers to blame the manufacturing process and quality control. But these same engineers are quick to admit the near impossibility of designing some 14,000 parts so they'll go together without any squeaky fits.

• **Little Noises** — As car designs have improved, the over-all noise level has dropped. Many previously unheard rattles stemming from design irregularities have become acoustically irksome. It's a problem that quality control can't do much about. What's needed is a small crew of production engineers who can follow each year's models from the drawing board through manufacturing so minor mistakes can be spotted and corrected before the cars go into full production.

• **Sleuths**—That is exactly what William Hart and Richard James do at Chevrolet's engineering center, Warren, Mich. They're the two engineers Mr. Cole was talking about. While other engineers and designers are checking functionability and making sure parts are designed so they can be easily manufactured and assembled, Mr. Hart and Mr. James are searching for design misfits that might make noise.

All automakers are aware of the problem. They attack it in research labs, during basic design, and in manufacturing and assembly. The sleuthing approach is added at Chevrolet.

• **On Drawing Boards**—"A good 20 months before the cars go into production we check layouts to see here are any design changes that be made to prevent poor fits. out a year before production starts, a design mockup is made to check fits and dimensions of all parts that will go into the new model. At this stage, we look for redesigned parts to see how they fit with parts that haven't been changed that year," explains Mr. Hart.

• **Prototype Models** — Some eight months before production, functional prototype cars are built by hand at Chevy's Flint, Mich., assembly plant. The prototype jobs are choice hunting grounds for squeaks and rattles.

Last year, for example, the rear door lock on one of the four-door models sounded like a tuning fork when the door was slammed. Reason: Slight design changes allowed one of the door lock springs to vibrate too much. Solution: Rather than redesign, Chevrolet figured it was cheaper to rubber coat the spring to damp out excessive vibrations.

"It's easy to correct noises at this time. Usually, all it takes is a call to the design engineer or production department responsible for the part," says Mr. Hart.

• **Pilot Line Runs**—A month ahead

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Beat-the-Experts Contest

"Entries are piling up like autumn leaves," reports our Beat-the-Experts editor. "Everybody is getting into the act . . . from presidents to mail boys." Here are the rules: The forecaster who most nearly pegs the number of cars to be built in the U. S. from Jan. 1 through June 30, 1959, will win a scale model of General Motors' Firebird III. Ten runner-ups will get full color prints of a dream car rendered by George Walker, Ford's vice president and director of styling.

I believe _____ automobiles will be produced in the U. S. during the first six months of 1959.

Mail this to:

Beat-the-Experts Editor STEEL Penton Bldg. Cleveland 13, Ohio

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POSITION _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

of production, pilot line cars start rolling off assembly lines. Those cars ultimately are sold, but before they get to dealers, Mr. Hart and Mr. James shake them down to check for loose fits caused by lack of fasteners or inadequate reinforcement. They also listen for peculiar exhaust or ride "booms" that show up only in road tests.

"We don't use any special instrumentation because these are noises the car owner might hear in his routine driving, but when you get used to listening, these sounds just seem to leap out at you," Mr. James asserts.

That's how he and Mr. Hart discovered that the tail pipe on one of the '59 models was knocking against the lateral control bar bracket beneath the car. Manufacturing eliminated this rattle by flattening the tail pipe slightly at the point of contact.

• **After Introduction**—For at least six months after the new models appear, Mr. Hart and Mr. James man their listening posts to check for noises as parts begin to wear. Usually, they drive one of the 200 cars delivered to the engineering center for testing purposes, but sometimes they pick newly assembled cars to see whether a recurring rattle is caused by a design fault or stems from inadequate quality control.

"We make running changes in designs until we're so close to the model runout that it's cheaper to correct the defects in the new models that will be coming out in a few months," explains Mr. Hart. Testing usually winds up in March or April.

• **Supplier Parts** — Sometimes the noisemakers are purchased from venders. Mr. James recalls the case of the rattling rewind knob. Chevrolet was buying its clocks from two sources. Some clocks rattled; others didn't. Mr. James found that one manufacturer was putting a small rubber grommet on the clock rewind knob to keep it from knocking against the instrument case. Chevrolet got the other supplier to do the same and the noise stopped.

In case you're wondering, the team of engineers found and eliminated 15 or 20 noises on 1959 pre-pilot models. Among the corrections were the addition of a spring washer to a dummy tone control knob on the radio, putting a rubber gasket around the speedometer housing base, and placing a spacer between the hub of the steering wheel and the steering column so the hub won't bind or hit the directional signal lever housing.

If your new Chevy rattles, Mr. Hart says you should make sure the noise is caused by faulty design rather than a quality control slip before you write a letter about it. If you do write, he hopes you'll send the letter to STEEL instead of to him. Chances are the kind of noise you are hearing has been eliminated on later cars by a running change. If not, it undoubtedly is being heard in cars being tested.

Exclaims Mr. Hart: "Believe me, it's bothering us more than it is you!"

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	642,090
February	392,112	571,098
March	357,049	578,826
April	316,503	549,239
May	349,474	531,365
June	337,355	500,271
July	321,053	495,628
August	180,324	524,354
September	130,426	283,852
October	261,696	327,363
10 Mo. Total	3,135,349	5,004,086
November		578,601
December		534,714
Total		6,117,400

Week Ended	1958	1957
Oct. 25	70,973	104,987
Nov. 1	97,804	126,139
Nov. 8	125,279	136,742
Nov. 15	117,688	141,904
Nov. 22	141,222†	151,846
Nov. 29	150,000*	114,795

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Exhaust Notes

• De Soto has introduced its Adventurer model, a limited production luxury car which basically is the Fireflite body with special trim. It's available in two door hardtop and convertible styles.

• A total of 12,031 Simcas was sold in the U. S. in the first nine months, vs. 3374 in the same period of 1957.

NOW greater economy, improved quality with JOHNSON *Continucast* 105″ bronze bars

Now famous Johnson quality solid and tubular bronze bars are being produced by a continuous casting method to give you the economy and convenience of 105″ lengths.

CONTINUCAST bars are economical because your distributor will cut this long bar in multiples of a variety of lengths to suit your requirements. You buy and handle less metal—pay for only the metal you use.

The continuous casting method improves the physical qualities of the Johnson alloy 72 (SAE 660). Internal and surface defects are eliminated and the distribution of lead and other elements is more uniform. This improves machinability, makes for longer tool life. You also get greater tensile, yield, impact and fatigue properties.

Johnson **CONTINUCAST** 105″ Bronze Bars are available in 21 sizes of solid bars from ½″ to 3″ in diameter, and in 118 sizes of tubular bars which range from ½″ to 2½″ ID and from 1″ to 3″ OD.

To get the benefit of greater economy and quality of **CONTINUCAST** bars ask your distributor to supply you. For further information write for folder JBL-14.

**Trademark.*

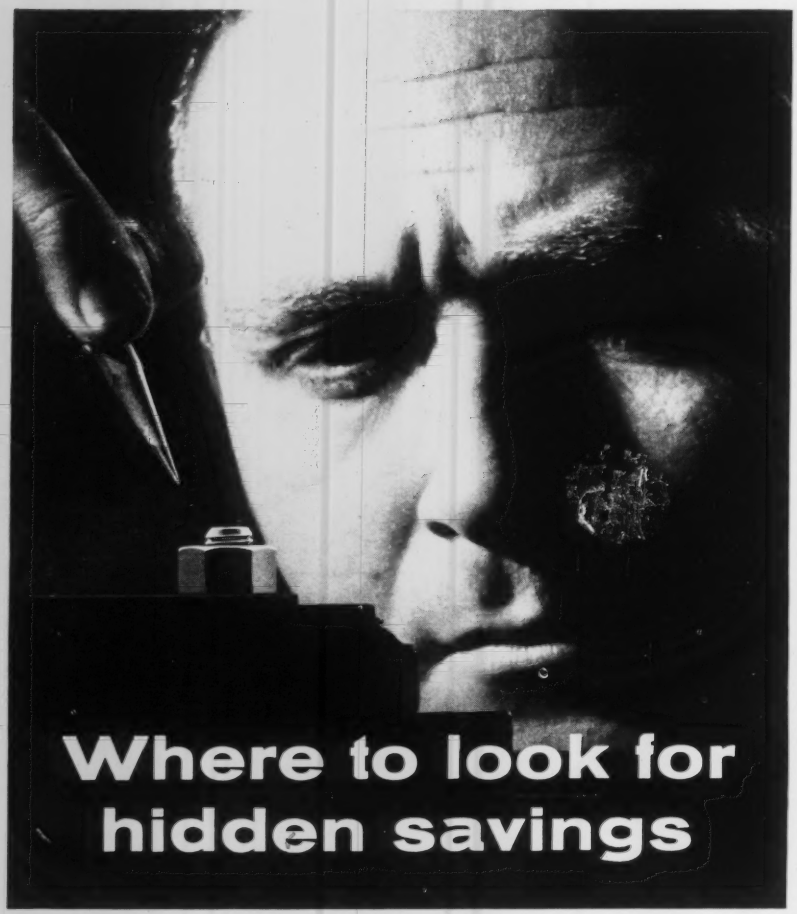
JOHNSON Bearings

Johnson Bronze

550 South Mill Street • New Castle, Pa.

Subsidiary: Apex Bronze Foundry Co., Oakland, Cal.

ECONOMIC FACTS ON FASTENERS



Where to look for hidden savings

- **Fastener value-analysis shows big dollar savings**
- **Quality improved at same time**

If you know what to look for, there are sizable savings to be found in standard fasteners. See what happened when the *RB&W Fastener Man* analyzed fastener usage:

Shown the merits of high strength bolts, a company standardized on them exclusively, saved $12,000 the first year, $28,000 the next.

Showing a manufacturer how to substitute high strength bolts for heavy head milled bolts, the RB&W Fastener Man pointed to a $4,500 annual saving on this item alone.

At a plant with 23,000 different fastener items in inventory, more than half were eliminated...cutting costs from buying to assembly.

Where special fasteners were used in heavy equipment, substituting cap screws offered $13,000 saving on a production run of 500 units.

So it goes. Using high carbon cap screws where costlier socket screws are not really needed . . . cap screws for studs and nuts in certain applications . . . replacing machined parts with cold headed pieces . . . there are plenty of ways to economize.

Take a look at your own fastener usage through the eyes of an RB&W Fastener Man. Contact Russell, Burdsall & Ward Bolt and Nut Co.

R B & W
114th year

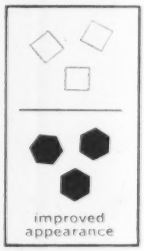
Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**

HEX and HEX: a major step in fastener simplification

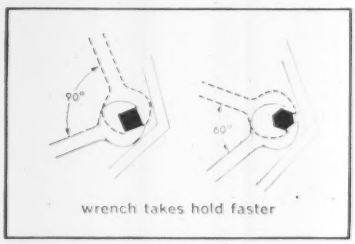
Under the new, RB&W Hex and Hex program, one hex head bolt and hex nut consolidates the best features of four other frequently used fastening units, all of which are intended to do the same job.

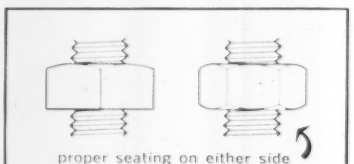
Simplifies inventory, speeds turnover. Streamlines ordering, stocking and usage.

Improves quality and appearance in the popular size range. In heading hex bolts, flow lines in the steel are distorted less than in square bolts. Strength is greater, tolerances closer. Hex heads are more attractive, too.



Cuts weight, reducing handling costs. For example, 1,000 Hex and Hex units in the ½" x 2" size weigh 25 lbs *less* than comparable square head bolts and square nuts.

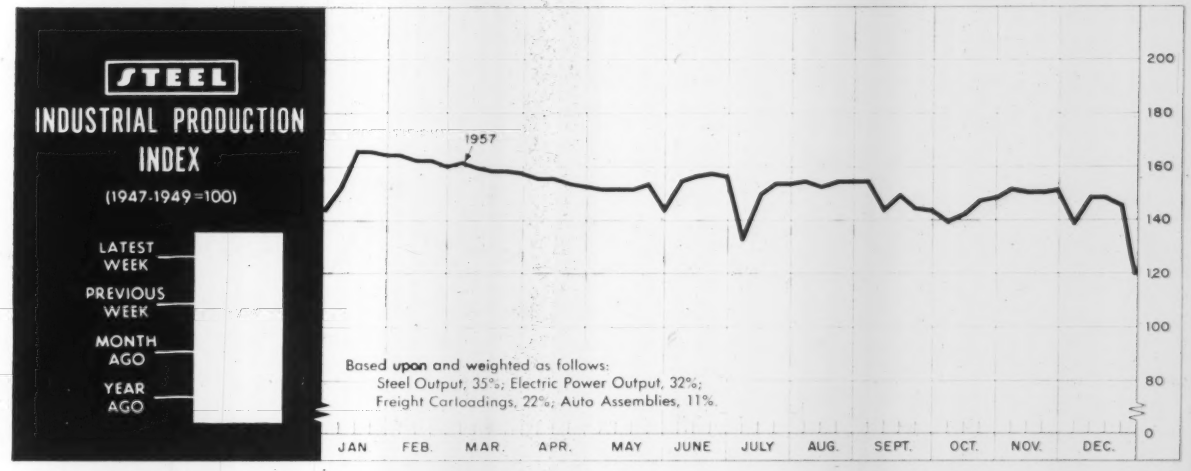




Speeds assembly. Hex permits faster, easier wrenching. Double chamfered hex nuts allow correct assembly from either side.

Cost no more than square head bolts and square nuts. Yet, look at the advantages. Ask the RB&W Man about it. Or, write for Bulletin HH-1.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



*Week ended Nov. 22.

Production Index at 15-Month High

STEEL's industrial production index reached a preliminary 154 (1947-49 = 100) for the week ended Nov. 22, a 15-month high and only 1 point shy of the August, 1957, peak that preceded the recession. It is well below the all-time peak of 168 set in early December, 1956.

It does not mean that the economy as a whole has regained all its lost ground, but it does indicate that the uptrend has been solidly based and that it should continue well into 1959. But the pace is certain to slow down once the effects of the big push from the auto industry have been spent. That will come in January or February.

• **Paradox**—Because our index is not seasonally adjusted, a simple comparison between the current level and the August, 1957, level is misleading. (The Federal Reserve Board's index, which is seasonally adjusted, still lagged the prerecession peak by 7 percentage points in October. The margin will be cut by 2 or 3 points for November.) But the seeming paradox can be explained by examining the individual components.

The two biggest factors in the recovery are electricity output and auto production. The weekly figures from the Edison Electric Institute put a built-in growth factor into any raw index. Even at the recession's deepest point, the nation's utilities were generating almost as much electricity as they did during better business times because of the expansion in population and private, commercial, and government use.

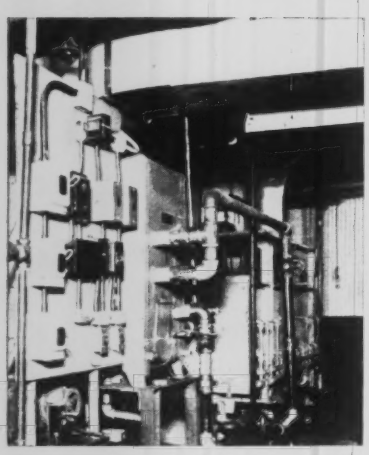
In the case of autos, the industry is just recovering from severe strike damage; it was going into model changeovers when the last peak in the index was reached.

• **Better Indication**—Steel production and freight carloadings come closer to showing the relationship between the two periods. Output

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,003[1]	2,000	1,846
Electric Power Distributed (million kw-hr)	12,500[1]	12,378	12,136
Bituminous Coal Output (1000 tons)	8,595[1]	8,530	9,147
Crude Oil Production (daily avg—1000 bbl)	6,950[1]	6,968	6,832
Construction Volume (*ENR*—millions)	$243.0	$374.3	$332.3
Auto, Truck Output, U. S., Canada (*Ward's*)	174,091[1]	149,178	184,365
TRADE			
Freight Carloadings (1000 cars)	630[1]	644	633
Business Failures (Dun & Bradstreet)	274	331	306
Currency in Circulation (millions)[3]	$31,754	$31,660	$31,336
Dept. Store Sales (changes from year ago)[3]	+3%	+2%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$25,378	$20,094	$24,580
Federal Gross Debt (billions)	$280.2	$280.2	$273.7
Bond Volume, NYSE (millions)	$33.3	$39.8	$26.6
Stocks Sales, NYSE (thousands of shares)	20,714	20,790	12,505
Loans and Investments (billions)[4]	$93.7	$93.9	$86.1
U. S. Govt. Obligations Held (billions)[4]	$31.3	$31.5	$34.8
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	217.5	217.3	205.8
All Commodities[7]	119.1	119.2	117.8
Commodities Other than Farm & Foods[7]	126.8	126.8	125.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,172; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1926-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.



NIAGARA *Aero*
HEAT EXCHANGER
***quickly* pulls down the initial peak load of heat in quenching... and saves cooling water**

● You gain in accurate control of quench bath temperatures and quickly effective capacity to handle initial peak load of heat in quenching. You prevent production set-backs, increase the output of your heat treating department, prevent oil fires, save losses from rejected parts.

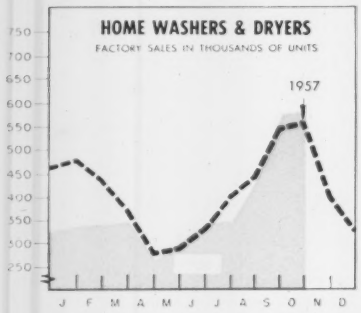
Niagara *Aero* Heat Exchangers give you this control in both furnace and induction hardening methods. They prevent both over-heating and over-cooling of the quench bath. Hundreds of heat treaters know they prevent many troubles, constantly improve quality and increase production.

They quickly pay for themselves by saving cooling water coils and extend your quench capacity without extra water or cooling tower.

Write for Bulletins 120 and 132 giving complete information.

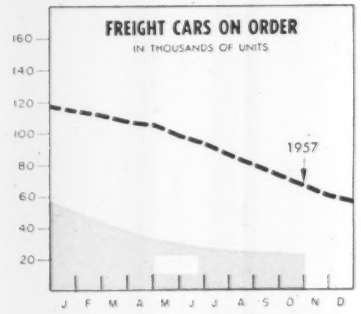
NIAGARA BLOWER COMPANY
Dept. S-12, 405 Lexington Ave.
NEW YORK 17, N. Y.
District Engineers in Principal Cities of U. S. and Canada

THE BUSINESS TREND



	Washers		Dryers	
	1958	1957	1958	1957
Jan.	238,153	331,314	98,630	144,621
Feb.	263,099	319,580	78,578	114,517
Mar.	278,891	286,205	70,309	83,668
Apr.	224,896	230,675	38,475	42,850
May	262,999	262,430	41,898	32,846
June	288,831	289,245	54,173	47,696
July	277,287	340,915	75,513	70,440
Aug.	326,785	329,146	109,833	117,055
Sept.	423,073	392,733	158,733	166,473
Oct.	404,056	377,621	180,405	185,772
Nov.	.....	260,460	.....	141,663
Dec.	.....	206,787	.....	118,116
Totals	.....	3,627,111	.....	1,265,717

American Home Laundry Mfrs. Assn.
Charts copyright, 1958, STEEL.



	Awards		Backlogs (end of month)	
	1958	1957	1958	1957
Jan.	401	5,328	48,787	114,656
Feb.	294	6,065	43,750	111,965
Mar.	239	5,359	38,027	107,708
Apr.	278	6,429	32,908	105,190
May	1,372	3,423	30,386	97,006
June	317	4,918	27,757	91,810
July	376	1,251	25,994	85,229
Aug.	1,773	3,203	25,611	79,258
Sept.	1,582	3,257	24,982	71,981
Oct.	781	2,202	23,670	65,718
Nov.	.....	1,070	.....	59,194
Dec.	.....	3,492	.....	55,941
Total	.....	42,051		

American Railway Car Institute.

now is running close to 2 million tons of steel a week, compared with 2.1 million before the recession. That gap is closing, partly because of today's improved business and partly because of last year's downtrend.

Freight carloadings are virtually even with the year-ago totals (for the first time in 15 months), but they are still considerably below the prerecession level. Part of that is because of the seasonal decline which started four weeks ago, but there is no denying that goods just are not being shipped at the rate of some of 1957's better months.

Charts Show Broad Base

The composite presented by the weekly graphs and tables compiled by STEEL (four of which are shown above) provides better insight into what is happening to business, particularly metalworking. Out of 45 separate statistical series, 31 show that in the latest month of record conditions were better than they were in the previous month. (Most of the data cover September and October.) Improvement was shown by only 20 in July and 19 a year ago. In the latest month on record, ten were still below the month-ago figures, and four were about even.

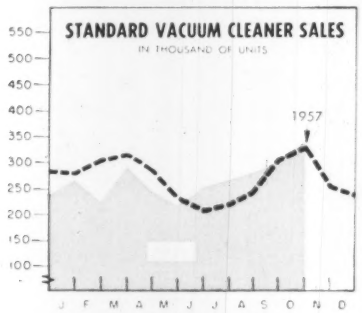
On a year-to-year basis, though, it is still evident that there is much room for improvement. Thirteen series are above the corresponding 1957 levels (compared with eight in July and ten a year ago) while 31 are behind.

Shipments and production have made the biggest comeback. Out of 20 series, 19 are above the prior month's levels. Six of the 20 are now above the year-ago level. Notable in this group are the appliances. Only three production statistics were above the corresponding 1957 levels in July.

Seven of the 11 statistics on new orders are above the prior month's figures. The same seven showed month-to-month improvement in July. The capital goods industries are still the slowest performers. While new orders for only one group were ahead of the 1957 level last July, today improvement is seen in three series.

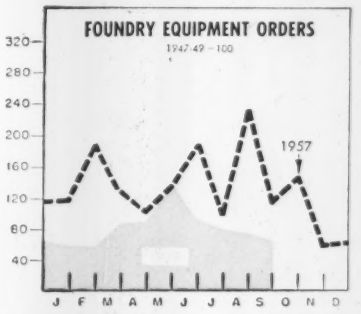
Backlogs are the weakest element. They are continuing to decline in the industries tabulated, mainly foundries and the railroad industry.

Prices and wages, as expected, are well above the year-ago level,



	1958	1957	1956
Jan.	265.489	276.738	302.203
Feb.	225.631	300.887	286.386
Mar.	291.418	312.746	395.686
Apr.	247.293	281.627	352.873
May	218.766	231.246	326.008
June	253.127	207.286	248.326
July	263.778	218.276	259 774
Aug.	280 226	241.218	276.932
Sept.	299.618	302.869	320.278
Oct.	339.127	328.655	371.998
Nov.	.....	251.123	300.381
Dec.	.....	237.501	281.025
Totals	.....	3.190.172	3.721.870

Vacuum Cleaner Mfrs.' Assn.



	1958	1957	1956
Jan.	57.9	117.9	195.6
Feb.	57.6	188.4	169.0
Mar.	85.9	127.0	152.7
Apr.	88.7	101.1	135.2
May	136.1	136.2	207 0
June	87.7	187.5	156.7
July	77.9	98.6	110.3
Aug.	74.1	231.3	188.3
Sept.	64.5	113.9	114.7
Oct.	.....	145.3	122.2
Nov.	.....	59.6	121.0
Dec.	.....	61.4	115.6
Avg.	.....	130.7	149.0

Foundry Equipment Mfrs. Assn.

but on a month-to-month basis, they have leveled off a great deal.

Bellwether Shows Uptrend

One of metalworking's most sensitive bellwether industries points to further strengthening of the uptrend. New orders for screw machine products for the month of September reached the highest level since October, 1957, reports the National Screw Machine Products Association. They were 7 per cent above the August total, representing the fifth consecutive month in which orders have topped shipments.

Appliances Take the Lead

Appliances continue to be among the better performers in the recovery. In the composite mentioned above, they accounted for a good part of the month-to-month improvement in the production score. At the same time, they accounted for the only setback. In October, home washing machines lagged behind the September pace by 5 per cent after showing steady gains through most of the fall (see table, Page 56).

But home laundry appliances as a whole had the best month in two years, exceeded only by the peak month of October, 1956, reports the American Home Laundry Manufacturers' Association. Factory sales of gas dryers and washer-dryers set all-time highs.

The improvement in vacuum cleaner sales noted in the graph above has narrowed the gap between the first ten months of this year and the corresponding period of 1957 to less than 1 per cent. Earlier in the year it was as much as 12 per cent. October's sales compare favorably with the best months in the industry's history.

Incorporations Set Record

The improved business situation is reflected in the uptrend in business incorporations and the slacking off in failures. Dun & Bradstreet Inc. reports that October was the best month on record for new charters. The 13,633 total was 1.6 per cent better than the previous high established in March, 1955.

Failures in the week ended Nov. 13 dropped off to 274, says D&B, marking the sixth time in the last three months that the weekly total has dipped beneath the year-ago figure.

Somers

STAINLESS STEEL

.010 to .001 25" wide; down to .00015 in narrower widths.

All regular commercial tempers.

Commercial bright anneal finish.

Unique annealing facilities provide uniform temper and uncontaminated surface.

Coils or cut lengths, both with #3 edge.

302, 305, 321, 347, 430, 17-7PH, PH15-7MO plus various high temperature alloys and rare metals.

Available for prompt shipment in production quantities.

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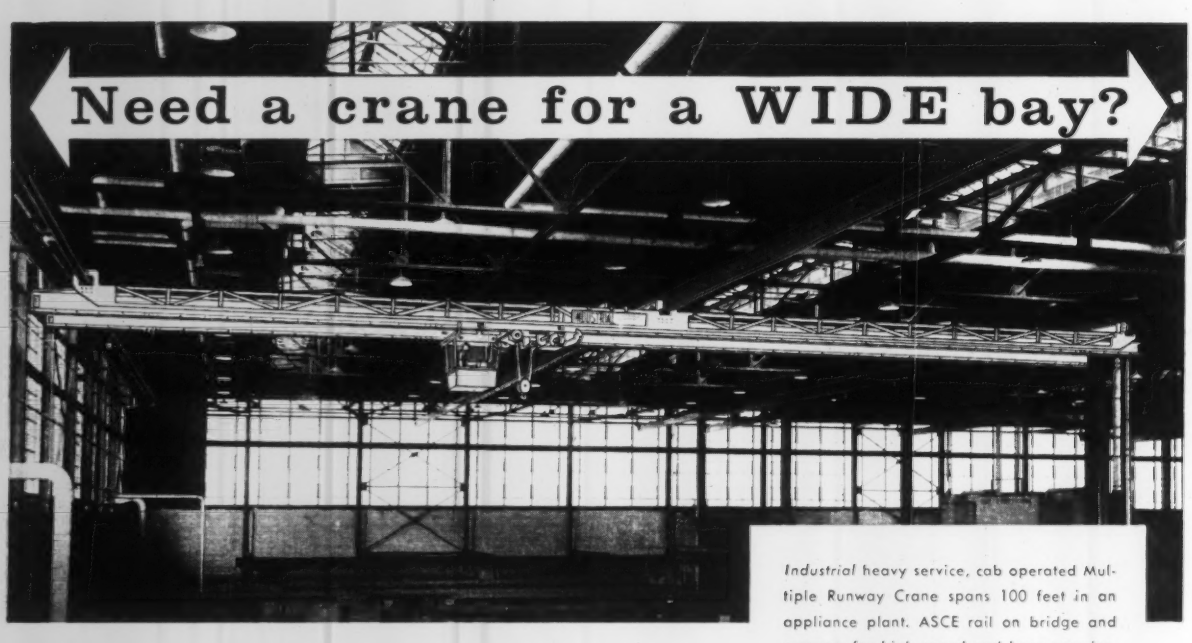


Industrial heavy service, cab operated Multiple Runway Crane spans 100 feet in an appliance plant. ASCE rail on bridge and runways for high speed and heavy service.

Industrial

Multiple runway cranes provide crane coverage over widest bays

If you are planning an extra wide shop bay requiring overhead crane service and still want to keep floor areas clear of supporting pillars, *Industrial's* Multiple Runway Crane will fill the bill. Multiple runways allow minimum depth and weight of crane bridge and eliminate intermediate supporting pillars even on extremely long spans. This member of the versatile *Industrial* crane family is ideal for warehouse or similar application where wide, unobstructed floor space is at a premium.

Trouble-free service is built into *Industrial* Multiple Runway Cranes with engineering features proved superior in *Industrial* standard high quality underhung cranes:

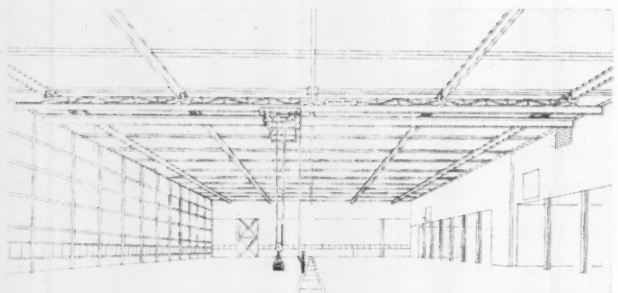
- Forged steel heat treated wheels.*
- Patented removable axles.
- Flexible couplings throughout.
- Gear drive enclosed in oil bath.
- Jig-assembled and jig-bored end trucks with large gusset plates for perfect alignment.
- Precision ball and roller bearings.
- Channel or truss type outrigger standard equipment for extra support.

*All driver wheels are heat treated for extra wear.

Industrial Heavy Service Underhung Track Section.

This heavy service *Industrial* track combines the durability of a high carbon manganese running surface with the safety of a ductile structural I-beam load-bearing member.

One of three *Industrial* floor operated, 15 ton Multiple Runway Cranes installed in an aircraft factory. Cranes span 130 feet.



To obtain fullest economy from *Industrial's* Multiple Runway Crane in new or existing buildings consult with *Industrial* engineers. *Industrial* makes many other types of overhead and jib cranes and can recommend the type and size that will best fill your needs. Send for Catalogs.

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ROLAND LEHR
Gear Grinding president

NICHOLAS M. ADAMS
National Aluminate v. p.

ADAM J. ALT
Wilbur B. Driver supt.

J. D. MATTIMORE
Tube Turns v. p.

Roland Lehr was elected president of **Gear Grinding Machine Co.**, Detroit. He continues as president of Baker Bros. Inc., Toledo, Ohio.

Nicholas M. Adams was named vice president of **National Aluminate Corp.**, Chicago, and general manager, oil products and chemical division. He was president of Oil Products & Chemical Co., recently acquired by National.

Andrew W. Rose was elected president, **Byron Jackson Div.**, Los Angeles, Borg-Warner Corp. He succeeds **E. S. Dulin**, now chairman. Mr. Rose, now chief executive officer, was vice president and assistant to the president.

R. B. McMullin was made extrusion product manager for **Kaiser Aluminum & Chemical Sales Inc.** He has headquarters in Chicago.

Nathan Cohn, former manager, market development division, fills the new post of vice president-technical affairs of **Leeds & Northrup Co.**, Philadelphia. He is responsible for supervision of the research and development department, the engineering department, and the patent division. **Donald E. Moat**, director-marketing, was made vice president-marketing. **John F. Quereau**, director-manufacturing, was made vice president-manufacturing.

McCormick Selph Associates, Hollister, Calif., appointed **Dr. Frank J. Lavacot** director of research and development. He was head, propulsion systems division, U. S. Naval Ordnance test station.

Adam J. Alt was promoted to general superintendent, **Wilbur B. Driver Co.**, Newark, N. J. He was director of production control.

Harry G. Smith, manager of A. O. Smith Corp.'s meter division at Los Angeles, was named president and general manager of the recently acquired **Erie Meter Systems Inc.**, Erie, Pa. **L. F. Smith** (no relation) continues at Erie as vice president-operations.

Melvin F. House Jr. was made plant superintendent, **Michigan Seamless Tube Co.**, South Lyon, Mich. He was assistant plant superintendent.

Charles C. Snider was made director of sales, **Consolidated Electrodynamics Corp.**, Pasadena, Calif. Former sales manager, he succeeds **William F. Johnson**, recently named director of the company's newly formed sales engineering department.

Gilbert A. Hanke was named product manager, stainless tubing, **Allegheny Ludlum Steel Corp.**, Pittsburgh. He is succeeded by **Thomas J. Gorman** as general superintendent, extrusion and cold draw department, Watervliet, N. Y., Works.

Edwin J. Mejia, vice president, was elected chief sales management officer of **Aluminium Ltd.**, Montreal, Que. Mr. Mejia resigns as chief employee relations officer to accept the appointment, effective Dec. 31, when he succeeds **Elmer G. MacDowell**, resigned. Mr. MacDowell will continue as a director and vice president of the company.

J. D. Mattimore was made vice president for product engineering and research, **Tube Turns Div.**, Louisville, Chemeron Corp. He has been director of its product engineering and research department.

John J. Heidenreich was named manager, production control, at the Brackenridge, Pa., Works, **Allegheny Ludlum Steel Corp.** He was superintendent of production planning, and is succeeded by **W. J. Mentzer.**

Morse G. Dial, president, **Union Carbide Corp.**, New York, assumes the new office of chairman, and continues as chief executive officer. **Howard S. Bunn**, executive vice president, becomes president. **Kenneth H. Hannan** continues as executive vice president, and **Birny Mason Jr.**, vice president, becomes executive vice president.

William A. McCullough Jr. was appointed sales manager, **W. O. Barnes Co. Inc.**, Detroit. He succeeds **Vernon H. Olson**, recently elected president. Mr. McCullough was assistant domestic sales manager at Nicholson File Co.

James F. Orr succeeds **Arthur T. Newell** (retiring Jan. 1) as works manager, Henderson, Nev., **Stauffer Chemical Co. Leonard J. Edwards** was made assistant works manager. Mr. Newell will continue in a consulting capacity.

Dr. Wilfred A. Bychinsky was made chief engineer of automotive products for **AC Spark Plug Div.**, Flint, Mich., General Motors Corp. He succeeds **Leo W. Tobin Jr.**, recently

CHARLES I. MacGUFFIE
Air Reduction dept. mgr.

CHARLES M. GEORGE
Gardner-Denver v. p.

EARL L. WRIGHT
Mine & Smelter Supply post

EDWARD N. WRENSHALL
Kerotest general manager

made manager of AC's Milwaukee operations.

Charles I. MacGuffie was appointed manager of **Air Reduction Sales Co.'s** new special products department, organized to provide engineering assistance to customers. It is an expansion of the machine welding department organized in 1955. Mr. MacGuffie's office is in New York. Formerly, he was manager of marketing, welding department, General Electric Co. **J. H. Berryman**, previously manager, machine welding department, was named general sales manager of the new department.

Elmer Lehmkühl was appointed sales manager, **Arcair Co.**, Lancaster, Ohio, responsible for marketing and sales of products in the eastern division.

A. M. Kelly was made San Francisco district sales manager for **Duff-Norton Co.**

Arthur H. Uhler was made western regional director, **Richards-Wilcox Mfg. Co.**, Aurora, Ill. Effective Jan. 1, the office of the western region will be in Los Angeles.

Frank E. Greene was made marketing manager, airborne systems department, **RCA Defense Electronics Products**, Camden, N. J., Radio Corp. of America. He succeeds **Ralph S. La Montagne**, who became marketing manager of the new missile electronics and controls department, Burlington, Mass.

Robert H. Ebersole was made Detroit district sales manager, **Federated Metals Div.**, American Smelting & Refining Co.

Charles M. George, secretary, was elected vice president and general manager-operations of the two plants of **Gardner-Denver Co.**, Quincy, Ill. **Aubrey H. Jones**, vice president-export division, was elected president of Gardner-Denver International C. A., new subsidiary. **Kenneth J. McDaniel** was elected secretary.

Earl L. Wright was made manager, industrial supply department, **Mine & Smelter Supply Co.**, at the Salt Lake City, Utah, branch. He succeeds **E. I. Lundstrom.**

John W. Touhy was promoted to assistant sales manager, **Wilton Tool Mfg. Co. Inc.**, Schiller Park, Ill.

Chester A. Anderson was made assistant general manager, **Bay City Foundry Co.**, Bay City, Mich. He was plant metallurgist at Baker-Perkins Inc.

Arvid Nelson was appointed assistant to the general manager at **Hamilton Standard**, a division of United Aircraft Corp., Windsor Locks, Conn. **Ermano Garaventa** succeeds Mr. Nelson as factory manager.

Carl J. Tylka was made director of technical service for **Cooper Alloy Corp.**, Hillside, N. J.

Dr. Ruben F. Mettler was appointed executive vice president and general manager of the newly incorporated **Space Technology Laboratories Inc.**, Los Angeles. He was vice president and assistant general manager of the laboratories, formerly a division of Ramo-Wooldridge Corp. STL is in charge of over-all scientific direction of the Air Force's ballistic missile program.

Edward N. Wrenshall fills the new post of general manager, **Kerotest Mfg. Co.**, Pittsburgh. He will direct and co-ordinate the steel and brass divisions of Valve Mfg. Co.

J. S. Urbanik was made manager of plant operations, electrical conductor division, **Kaiser Aluminum & Chemical Corp.**, Newark, Ohio. He is succeeded as manager of the Newark plant by **W. E. Linne.**

Ernest A. Baker was made outside sales representative; **Howard H. Jones**, sales engineer-foundry and industrial coke and pig iron for **New England Coke Co.** and **Mystic Iron Works**, sales subsidiaries of Eastern Gas & Fuel Associates, Boston.

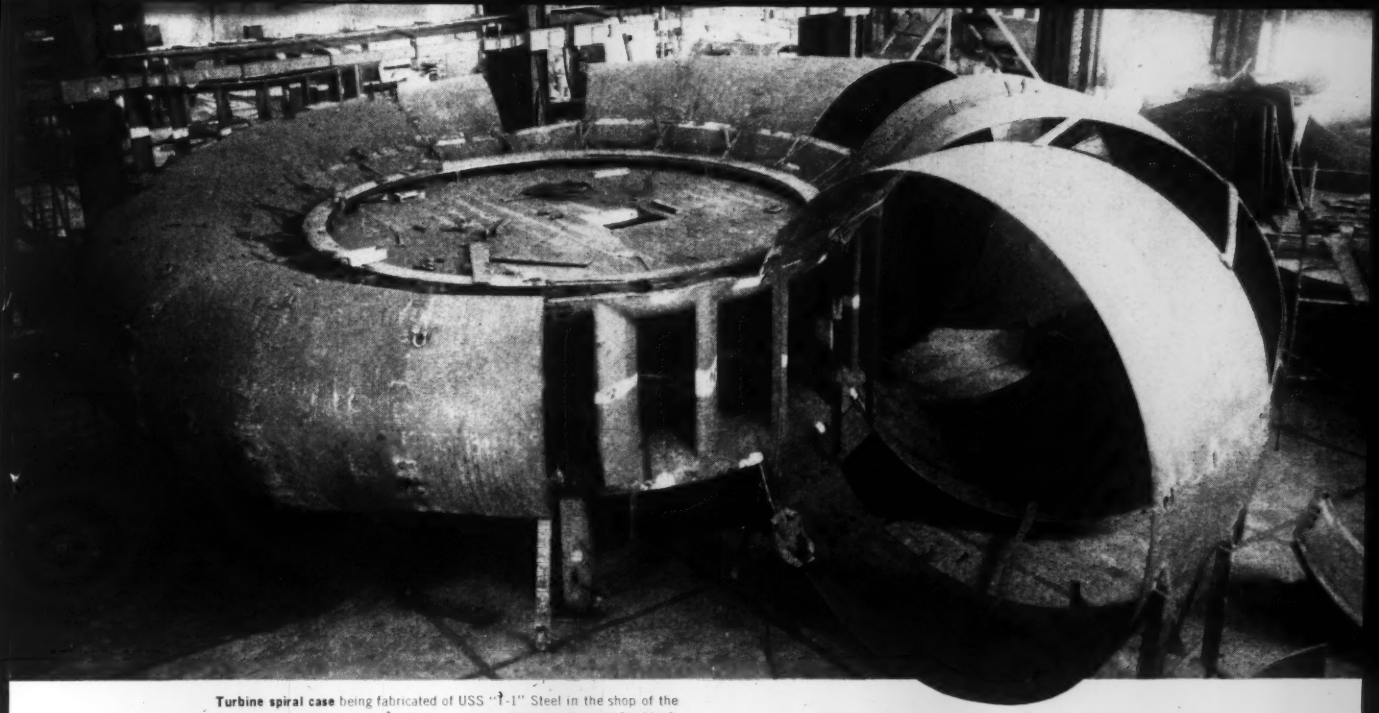
William H. Trout was appointed divisional controller of Carpenter Steel Co.'s **Alloy Tube Div.**, Union, N. J.

Wallace J. Feasler was made sales manager, **Molded Fiber Glass Co.**, Ashtabula, Ohio.

James A. Kelly was named manager of sales promotion, **Buflovak Equipment Div.**, Buffalo, and **Dairy Equipment Div.**, Mora, Minn., for Blaw-Knox Co.

John Knarr was made government sales manager, **Baker Industrial Trucks Div.**, Otis Elevator Co., Cleveland. He was senior development engineer, military products.

Western Rolling Mills Div., Yuba Consolidated Industries Inc., named for its new Tempe, Ariz., plant; **Palmer B. Ford**, sales manager; **R. A. Andrus**, general mill superintendent; **Joseph Ackerman**, main-



Turbine spiral case being fabricated of USS "T-1" Steel in the shop of the S. Morgan Smith Co., York, Pa. Plates ranged in thickness from ½" to 1 15/16".

Taming the mighty Snake River with turbine spiral cases of USS "T-1" Steel

Stronger steel reduces weight . . . cuts costs

Four of these huge spiral cases are being built for the Idaho Power Company for use in the Brownlee Dam on the Snake River near Robinette, Oregon. They are designed for a 250-foot head of water. The inlet is 18 feet in diameter and each turbine will generate 144,000 horsepower at a speed of 128.6 rpm. Water will flow through the cases at a rate of 5,460 cubic feet per second.

Because of the fierce pressure, it was obvious that a strong steel was required. USS "T-1" Steel was selected because it has a minimum yield strength of 100,000 psi. What's more, it can be fabricated, is readily weldable and has a high resistance to impact abrasion.

Cost savings. By using USS "T-1" Steel, there will be substantially less shipping weight across the country and less weld time and weld metal, both in the shop and on the job site. Had carbon steel been specified, double thicknesses would have been required.

Fabricating operations. Projection of the dimensional outline on the plates was done with Lumitrace. Plates were cut to size by flame-cutting and rolled cold to shape. Some parts were finish welded, others were tack welded and assembled. The spiral case was then disassembled and shipped. Finish welding of segments is to be done at the dam site.

This job points up the economies possible with the use of USS "T-1" Steel. Why not use it for your own equipment? Write for our "T-1" book containing complete information. United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

Remember that we also make USS COR-TEN*, USS TRI-TEN* and USS MAN-TEN* Steels . . . widely used in power generation equipment.

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

USS United States Steel

*TRADEMARK

LESTER G. WHITE
Alabama Metallurgical pres.

ELLIS P. HANSEN
A-C steam turbine chief eng.

HOWARD R. SILVERTHORN
Chrysler Marine & Engine mfg.

tenance superintendent; **Eugene J. Schwetz**, chief metallurgist.

Lester G. White was elected president of **Alabama Metallurgical Corp.**, a new firm. Calumet & Hecla Inc. owns 70 per cent of its stock; Brooks & Perkins Inc., owns the balance. **H. Y. Bassett**, president of Calumet & Hecla, was named chairman and chief executive officer of the new firm, which has broken ground for a magnesium producing plant at Selma, Ala., scheduled to be in production by September, 1959. Other officers are: **E. H. Perkins** and **D. W. Blend**, vice presidents; **A. E. Petermann**, secretary; **F. J. Gibbons**, treasurer. **H. Howard Perkins**, president and chairman of Brooks & Perkins, is chairman of the executive committee.

Karl Gerteis was made manager, development engineering department, **Unitary Equipment Div.**, Carrier Corp., Syracuse, N. Y. He was manager of the compressor development department. **Maurice J. Wilson** was made sales manager, commercial air conditioning, for the division.

E. L. Decker was made assistant chief engineer of **Fuller Co.**, Catasauqua, Pa. He was supervisor of compressor engineering, and in charge of fan development. He succeeds **Robert E. Metzger**, now chief engineer of the Dracco Div. in Cleveland.

Alexander M. Beebee was made plant engineer, Rochester, N. Y., products division, **General Motors Corp.** He replaces **Walter A. Scott**, now senior engineer in the plant layout and methods department.

Ellis P. Hansen was appointed chief engineer, steam turbine department, **Allis-Chalmers Mfg. Co.**, Milwaukee. He was assistant chief engineer.

Dr. **F. C. Langenberg** and **G. E. Hutchinson** were appointed material and process engineers by **Crucible Steel Co. of America**, Pittsburgh. Dr. Langenberg is responsible for standards of materials, processes, and measurements in primary steelmaking operations. Mr. Hutchinson sets up standards for measurement and analysis of product quality and yield.

Veet Industries, East Detroit, Mich., appointed **Sidney E. Beach** Michigan district sales manager of its **Radial Drill Mfg. Div.**

John P. Vaughn was made Los Angeles district sales manager, **Voi-Shan Mfg. Co.**, division of Pheoll Mfg. Co.

Ray M. Shaver was made assistant vice president in charge of freight car engineering for **Pullman-Standard Car Mfg. Co.**, Chicago.

Richard A. Villacres was made western division sales manager for **Huck Mfg. Co.**, Detroit. He replaces **Ray V. Clute**, now assistant to the vice president-sales.

Ray C. Joschko was named sales manager, **Dixie-Merkle Cup Dispenser Div.**, Merkle-Korff Gear Co., Chicago. He was Minneapolis district manager of the company.

Charles Eric Ho was made assistant manager of market and economic analysis for **Climax Molybdenum Co.**, division of American Metal Climax Inc., New York.

Howard R. Silverthorn was made director of manufacturing, **Chrysler Marine & Industrial Engine Div.**, Chrysler Corp., Detroit. **Howard D. Peacock** was named chief engineer.

Fred O. Hosterman was promoted from executive vice president and director of sales to president and general manger, **Weston Hydraulics Ltd.**, North Hollywood, Calif., subsidiary of Borg-Warner Corp. He succeeds **I. E. Weston**, now chairman and chief executive officer. Changes are effective Jan. 1. **A. E. Shumate** was promoted from vice president and assistant general manager to executive vice president-assistant general manager.

Joseph L. Sisto was made upper New York district sales manager for **Phoenix Iron & Steel Co.**, subsidiary of Barium Steel Corp. He has headquarters in Syracuse, N. Y.

Raytheon Mfg. Co., Waltham, Mass., promoted **Albert E. Keleher** to the new post of manager of marketing planning, government relations, for the government equipment division. He is replaced as product sales manager, communications systems, for the division by **Raymond Kendall**.

T. C. Van Cise was appointed superintendent of plant protection at **Republic Steel Corp.'s** Youngstown steel plant. He succeeds **W. E. Butler**, retired.

OBITUARIES...

Roy W. Tompkins, 62, vice president-sales, **U. S. Reduction Co.**, East Chicago, Ind., died Nov. 15.

L. P. Sperry, 75, former chairman and president, **Scovill Mfg. Co.**, Waterbury, Conn., died Nov. 22.

E. B. Gleason, 55, president, **Gleason Works**, Rochester, N. Y., died Nov. 21.

George E. Gernon, 87, secretary, **Gisholt Machine Co.**, Madison, Wis., died recently.

James H. Walsh, 80, former vice president, **Inland Steel Co.**, died in Chicago Nov. 16.

Wheels coated with ALUNDUM abrasive give housing covers a high polish faster and for less money. Setting up the wheels, as shown, is an easy job. The high capillarity of this polishing grain improves and speeds up the wetting process with glue or cement.

Pay less for polishing...set your wheels up to save!

ALUNDUM abrasive brings you the value-adding, cost-cutting "Touch of Gold"*

Norton abrasives are first choice in many plants for better results at lower costs, in the widest range of polishing jobs.

Where especially long life is desired, the blocky shaped E_1 ALUNDUM B abrasive is extremely popular. Available in grit sizes 14 to 240. Where faster cutting action is required E_{138} ALUNDUM S abrasive (sizes 14 to 90) or E_{138} ALUNDUM R abrasive (sizes 100 to 240) are first choice. All three types are specially treated to give much greater adhesion with glue or cement. Typical advantages common to all ALUNDUM polishing grains include:

- *Uniform grain shapes*, which assure fast, uniform cutting action.
- *Uniform grain sizings*, with no oversize grains that mar the finish, no undersize grains to loaf on the job.
- *High capillarity*, assuring the easy absorption of adhesive that means longer lasting, better performing set-up wheels.

The booklet "Setting Up Metal Polishing Wheels and Belts" contains valuable facts on the various types of ALUNDUM abrasive . . . on the applications of canvas, leather or wooden wheels . . . and on the best means of preparing wheels, with cement or glue. Ask your Norton Distributor for it. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

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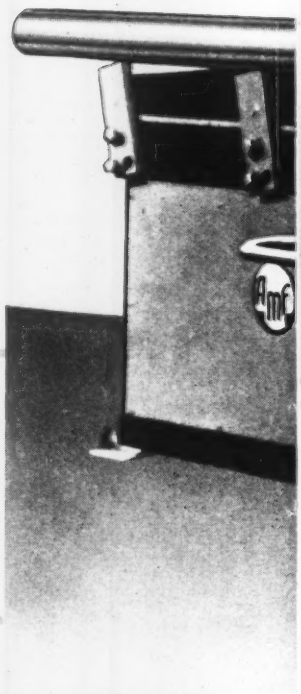
Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — **BEHR-MANNING DIVISION** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

MILBAND
BAND SAW
MACHINE TOOL

For FASTER Cut-off Sawing at LOWER COST!

The all-new MILFORD MILBAND is the *first* band saw machine specifically designed, developed and constructed from the bottom up to give you the extra ruggedness, rigidity, variable speed range and other characteristics needed to handle high speed steel band saw blades with maximum efficiency. Built to withstand the heavy feeds and fast blade speeds of which high speed steel blades are capable, the MILBAND Machine takes continuous, heavy duty sawing in its stride without requiring frequent or costly maintenance. Here, in fact, is the machine you need to produce more . . . save more!



MILBAND gives you lowest cost-per-cut . . .

because you get more pieces per man-machine hour. Fully automatic bar feed permits a completely automatic stock feeding cycle. Narrower kerf with at least 50% less chip loss means big savings in material.

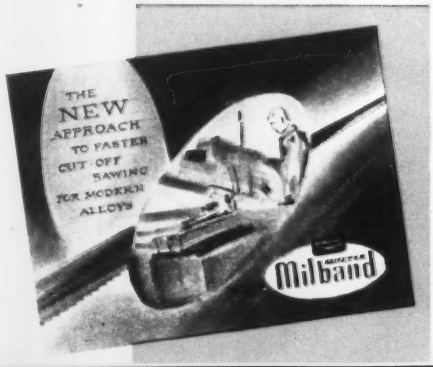
MILBAND cuts consistently straighter, smoother, more accurately . . .

than other cut-off methods. This means less allowance for waste, less subsequent machining time to remove surplus metal.

WRITE NOW FOR COMPLETE INFORMATION . . .

Ask for your free copy of this circular that fully describes all the time- and money-saving advantages of the new MILBAND Machine . . . shows how this machine will help you reduce per-cut costs and cut metal faster and more efficiently than ever before. Remember, the sooner you put a MILBAND to work in your shop, the more you'll save . . . so act today!

The Henry G. Thompson & Son Co., 277 Chapel Street
New Haven 5, Connecticut.



MILFORD

SAW & BAND SAW BLADES • STOCK • HOLE • HACK SAWS • GROUND FLAT

THE HENRY G. THOMPSON & SON CO., New Haven 5, Connecticut

Saw Blade Specialists for Over 80 Years

Plans Plate Mill

Installation of 4 high, 112 in. reversing mill at Republic's Gadsden plant will start soon

REPUBLIC STEEL CORP., Cleveland, will install a new plate mill at its Gadsden, Ala., plant. Work on the 4 high, 112 in., reversing, hot rolling mill will get underway after the first of the year. It will replace a 3 high, 112 in. mill and will be installed closer to the hot-strip mill for more efficient operation.

• **Larger Slabs**—Skelp for pipe 24 to 30 in. in diameter will be rolled from slabs weighing up to 8000 lb —double the previous weight.

Slabs weighing up to 13,000 lb will also be rolled for finishing on the plant's 54 in. hot-strip mill. (They will be almost twice as heavy as those previously processed for the strip mill.) The new mill will be capable of rolling slabs up to 20,000 lb when new equipment is added.

In addition to the skelp and slabs for in-plant use, the new mill may produce some plates for the trade.

• **Auxiliary Equipment**—A set of vertical edgers will be installed about 13 ft from the entry side of the mill to assure closely controlled widths and provide minimum loss from side trim of skelp and strip. Twin electrical drive motors (each 5000 hp) will provide power for the mill.

Two electric furnaces, placed in operation a year ago, increased the plant's steelmaking capacity by 50 per cent (to 1.2 million tons annually). A major part of the steel processed at Gadsden goes through the plate mill since the pipe and strip mills which it serves are two of the heaviest tonnage users among the plant's finishing mills.

Makes Superston Castings

Columbian Bronze Corp., Freeport, N. Y., has been licensed by Superston Corp. to make marine propellers and other castings in Superston, a bronze alloy (nominally 12 per cent manganese, 8 per cent aluminum, 3 per cent iron, 2 to 6 per cent nickel, and the remainder copper). Superston Corp. was formed recently by J. Stone & Co. Ltd. of England (developer of the alloy), Ampco Metal Inc., Milwaukee, and American Brake Shoe Co., New York.

Consolidates Purchasing

American Steel & Wire Div., including the Cyclone Fence Dept., U. S. Steel Corp., has closed purchasing offices in Chicago, North Chicago, Ill., and Worcester, Mass. The division has consolidated all buying in the Cleveland headquarters office, but will have a purchasing representative at Worcester to buy production materials used in making electrical wire and cable. R. W. Berrett is director of purchases.

Aluminum Mill Readied

Reynolds Metals Co., Richmond, Va., is preparing to start operation of a new 66-in. bright mill at its Sheffield, Ala., plant. The 2-high, single stand mill was designed and built by E. W. Bliss Co., Canton, Ohio, for high speed cold rolling of aluminum sheet. With a maximum speed of 1000 fpm the mill can reduce sheet thickness about 50 per cent. It can handle gages from 0.10 in. down to 0.006 in. Maximum strip input is 63 in.

Installation of the mill is part of the plant's $65 million modernization and expansion program, says G. L. Simms, general manager of Reynolds' Sheet Div. The program includes installation of a 170-in. hot rolling mill which is expected to be in operation in about a year. Another well-advanced phase of the program is the installation of heavy presses for blanking operations.

Buys Cogsdill Drill

Cogsdill Twist Drill Co. Inc., Oak Park, Mich., sold its drillmaking facilities to Cogsdill Twist Drill Co., a new subsidiary of Sheffield Corp., Dayton, Ohio. Sheffield is a subsidiary of Bendix Aviation Corp., Detroit. Sales and manufacturing operations have been transferred to Greenfield, Mass. Officials of the new company include Thomas Clark, president, and Roy Heldenbrand, general manager of the plant.

Birdsboro Converts Mill

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., modified roll stands in a continuous mill at Northwestern Steel & Wire Co., Sterling, Ill. The conversion permits the rolling of universal beams and is the first installation, Birdsboro officials say, where wide flange beams are rolled on a continuous mill. The new universal stands were rebuilt from existing horizontal, 2-high stands. The converted mill can be used to produce other carbon steel forms, such as angles, channels, and plates by switching stands.

Olin Mathieson Builds

A metallurgical research center for Olin Mathieson Chemical Corp., New York, that combines laboratories and an integrated pilot production plant will be completed at New Haven, Conn., by mid-1959. Estimated cost: $4 million.

Snyder Tool Changes Name

Snyder Tool & Engineering Co., Detroit, changed its name to Snyder Corp. The machine tool builder made the change to avoid confusing the company with tool and die manufacturers.

Geo-Drill Co. Formed

Geo-Drill Co. has been organized at Bridgevillle, Pa., by James L. Barrett. The firm will manufacture a portable diamond core drill and associated bits for drilling close-tolerance holes through reinforced concrete and masonry structures.

Loftus To Build Plant

Loftus Engineering Corp., Pittsburgh, has been awarded a contract to provide all engineering and construction supervision for the open-hearth portion of a new Argentine steel mill costing about $475 million. The contract was awarded by the government of Argentina on approval of Armco International Corp., acting as consultant on the project.

The new mill, Sociedad Mixta Metalurgia Argentina, will be located at San Nicolas. It will have an annual capacity of 750,000 metric

tons. Products will include structurals, mold shapes, rolled sheets, and tubes. The steel mill will contain four open hearth furnaces. Capacity of each: 250 metric tons.

Forms Tank Terminals Inc.

Buckeye Pipe Line Co., Cleveland, and Chicago Bridge & Iron Co., Chicago, organized a jointly owned company, Buckeye Tank Terminals Inc., 30 Broad St., New York, N. Y. The firm will construct, own, and operate terminal tankage and will lease the facilities.

Modernizes Skelp Mill

Laclede Steel Corp., St. Louis, awarded a contract to United Engineering & Foundry Co., Pittsburgh, for rebuilding and modernizing the 10-in. skelp mill at its Alton, Ill., plant. New equipment will include billet handling equipment at the entry side of the furnace, five roughing mills, a down and upcut shear, two edgers, and strip handling conveyors and rolls. Upon completion next fall, the mill will be capable of producing skelp up to 16 in. in width and will have greatly increased capacity.

NEW ADDRESSES

Thor Power Tool Co. moved its executive offices to 175 N. State St., Aurora, Ill.

Raybestos-Manhattan Inc., Passaic, N. J., moved its district warehouse and offices to larger quarters at 168 Beacon St., South San Francisco, Calif.

McDermott & Green (industrial equipment) moved to a new plant at 3429 Olympic Blvd., Los Angeles, Calif. Equipment includes forming and welding machines.

Abar Metals & Supply Co. moved to 1000 E. Slauson Ave., Los Angeles, Calif.

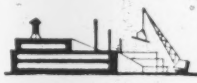
Spaulding Metals Co. Inc. established a new plant and administrative offices in Industrial Park, Syracuse, N. Y. Services of the company include hot tinning and production of metal castings.

CONSOLIDATIONS

Thomas Industries Inc., Louisville, will purchase **Benjamin Electric Mfg. Co.**, Des Plaines, Ill., subject to approval of stockholders. The firms make lighting equipment.

J. M. Nash Inc., Milwaukee, purchased **Bell Machine Co.**, Oshkosh, Wis., and will operate it as a subsidiary. E. J. Bell will remain as president and E. Paul Bell as vice president of the Oshkosh firm. both companies make machinery.

Misco Fabricators Inc., Marysville, Mich., merged with **Berlin Chapman Co.**, Berlin, Wis. Misco is a division of Consolidated Foundries & Mfg. Corp., Chicago. Production of high alloy weldments, fabrications, and heat resistant fixtures will continue at the Marysville plant.



NEW PLANTS

Ontario Culvert & Metal Products Ltd. has completed a plant for production of steel culverts at Waterloo, Ont.

Textron Metals Co., Girard, Ohio, opened a 45,000 sq ft plant at 1025 W. North Ave., Chicago. The firm makes home aluminum equipment.

Johns-Manville Corp., New York, has put its South Chicago, Ill., plant into operation. It is the seventh new factory the firm has built this year. It is operated by the Dutch Brand Div. for production of pressure sensitive tapes, adhesives, and related rubber products.

Bucyrus-Erie of Canada Ltd. officially opened its plant at Guelph, Ont. The firm, a subsidiary of Bucyrus-Erie Co., South Milwaukee, Wis., makes cranes and excavators.

Ultra-Sonic DeBurring Co., New Hyde Park, N. Y., opened a branch plant at 2300 Morris Ave., Union, N. J. The plant is equipped to remove microscopic and larger burrs from metal parts and to round edges to any measurable radius and tolerance.

Fisher Scientific Co., Pittsburgh, plans to open its 115,000 sq ft plant at Indiana, Pa., on Dec. 1. The facility will be operated by its Instrument Mfg. Div.

ASSOCIATIONS

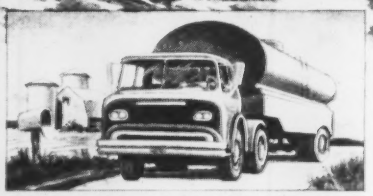
Plumbing Brass Institute, Pittsburgh, elected these officers: President, John H. Pimm, Bridgeport Brass Co., Bridgeport, Conn.; first vice president, Roger Milroy, Lee Bros. Foundry Co. Inc., Anniston, Ala.; second vice president, M. W. Peterman, Milwaukee Faucets Inc., Milwaukee; and treasurer, Nate Cohn, Dearborn Brass Co., Cedar Rapids, Iowa. Hanson & Shea Inc., Pittsburgh, was renamed executive secretary.

National Tool & Die Manufacturers Association, Cleveland, elected these officers: President, Jack Kleinoder, Vidmar Inc., Williamsport, Pa., and Volkert Stampings Inc., Queens Village, N. Y.; first vice president, J. A. Barth, Barth Corp., Cleveland; second vice president, H. G. Murdock, Arrowsmith Tool & Die Corp., Los Angeles; secretary, John Dewhurst, Arrow Tool Co., Wethersfield, Conn.; and treasurer, J. A. Perdy, Atlantic Mfg. Co., Philadelphia.

National Association of Aluminum Distributors, Philadelphia, elected these officers: President, Carl S. Vogel, Edgcomb Steel Co., Philadelphia; treasurer, Pollard Turman, J. M. Tull Metal & Supply Co. Inc., Atlanta; and vice presidents, G. D. Potter, Corey Steel Co., Chicago, and C. C. Carmichael, Copper & Brass Sales Inc., Detroit.

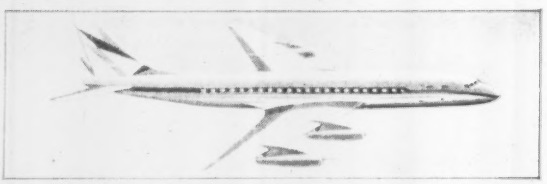
Caster & Floor Truck Manufacturers' Association, Chicago, elected these officers: President, W. R. Thomas, Thomas Truck & Caster Co., Keokuk, Iowa; vice president, L. T. Williams, Bond Foundry & Machine Co., Manheim, Pa.; treasurer, D. B. Anderson, Nagel Chase Mfg. Co., Chicago; and executive secretary, H. P. Dolan.

The steel plowshare was the basic agricultural tool when Wyman-Gordon was established seventy-five years ago. At that time, it took approximately 50 per cent of the nation's work force on farms to produce food for our country's needs.



With today's mechanical farm implements, it requires only 12½ per cent to feed our people. The development of modern farm implements, motor cars, trucks and tractors, railroad locomotives, and the "Mach era" aircraft and space vehicles, would have been impossible without forgings.

Whenever the ultimate is required in power, speed, endurance or reliability there is no substitute for a forging. Today, as for seventy-five years, Wyman-Gordon continues in the forefront in new forging developments.



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FORGINGS OF ALUMINUM • MAGNESIUM • STEEL • TITANIUM

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HARVEY, ILLINOIS • DETROIT, MICHIGAN

Technical Outlook

VISION FOR TOMORROW—The next decade will see great progress in applying ultrasonics to metalworking, says J. Byron Jones who heads up Aeroprojects Inc., West Chester, Pa., one of the country's leading research firms. Look for: 1. Solutions to difficult alloying problems. (Refractory elements can be quickly and easily dispersed in an ingot during solidification.) 2. Better results in the various squeeze forming methods. (Ultrasonic energy applied to a punch eases metal flow, or improves finish, or reduces power need.) 3. Faster machining with single point tools. (A lathe turns easier or faster when the tool is attached to a "force-insensitive" mounting coupled with an ultrasonic generator.)

CAST PLASTIC THREADS— A west coast manufacturer makes threaded caps for lead screws this way: He drills a hole through the diameter of a steel tube that is large enough to accept the screw. Coated with a parting agent, the screw is inserted, and an epoxy plastic poured around it. When hard, the screw is twisted out leaving a perfectly threaded cap. Next question: Why not cast a lead screw with a nut as a mold?

WIGGLE CUSHIONING—Next time you move equipment, don't overlook flexible machine mounts. They're gaining greatly over the traditional floor bolting techniques. Some firms claim maintenance costs are reduced (Leeds & Northrup, North Wales, Pa., is one proponent). Other plusses include higher quality work put out by the machines, less installation time.

BOW AT DOW—You can put a clear anodic coating on magnesium in less than a minute with a new process developed by Dow Chemical Co., Midland, Mich. A top coat of lacquer or varnish increases corrosion protection.

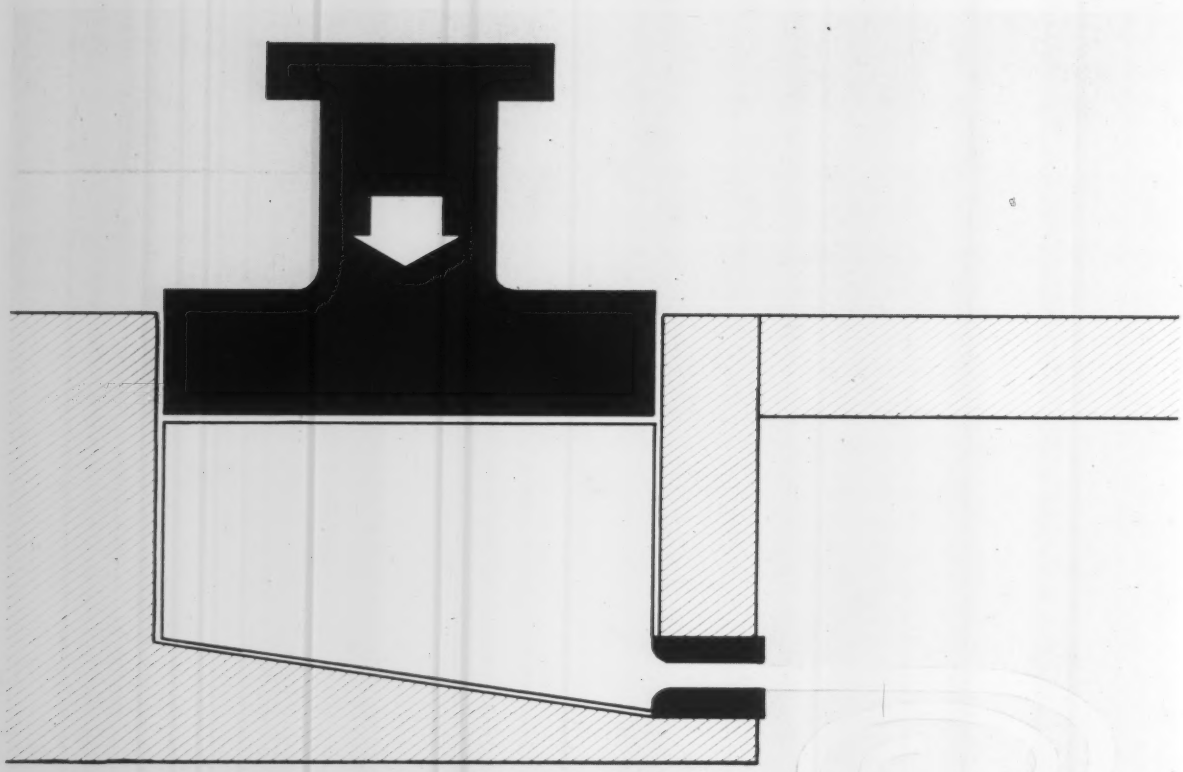
INDEPENDENCE IN AUTOMATION—One of the things to guard against in long, automated lines is the dependence of the whole line on each station. You must be sure that if one station shuts down, the whole line doesn't have to follow suit. Cross Co., Detroit, got around the problem with a new palletized machine built in a rectangle. One long side handles rough and semifinished machining operations on a gear housing. The other long side has two sections, one for finish boring, the other for gaging. Conveyors connect the three sections and each operates as fast as material comes to it. Any section can be stopped without shutting down the other two.

LESSENS BATH STEAM—Amchem Products Inc., Ambler, Pa., has a fluid which acts as a blanket over some liquid baths. It cuts down steaming (and the resultant heat loss) but doesn't interfere with chemistry. Some highly beneficial results are showing up in certain pickling installations, among which are reduced structural corrosion and improved working conditions.

MAKE YOUR OWN SALES FILMS—It's no problem to keep your salesmen, customers, or prospects informed of improvements in your product when you use do-it-yourself movies. Oster Mfg. Co., Cleveland, makes 16 mm sound films, gets several prints, and even dubs in Spanish, Dutch, French for its export department.

MISSILE MUSCLE—Uncle Sam has less and less faith in aircraft, says Cornell Aeronautical Laboratory, Ithaca, N. Y. Its transonic wind tunnel experience during 1958 dramatizes the shift. More work will go to Army and Navy missile projects in 1959, say university experts.

TITANIUM PROGRESS—Titanium Metals Corp. of America shipped a 3000-ft coil of 0.002-in. titanium foil to a honeycomb maker. Significance, say observers, is that such alloys can now be rolled on existing mill equipment and designers will be able to use annealed titanium. It eliminates the need for heat treated alloys to match the 200,000 psi compressive strength level and lightness of titanium.



In cross extrusion, the wire leaves the die at 90 degrees to the direction of applied force. Additional breakup of directional flow lines improves mechanical properties

Spring Wire Gets a Lift

Produced by cross extrusion, it shows a substantial increase in service life. Developers of process see it used to make other specialty items for crucial applications

CROSS EXTRUSION of spring wire may be the answer to longer life for springs, particularly those used on aircraft valves.

Engineers at Curtiss-Wright Corp., Buffalo, who are developing the method, believe that it brings the longitudinal and transverse properties of the wire closer together. Another advantage they cite is maximum internal working of the metal.

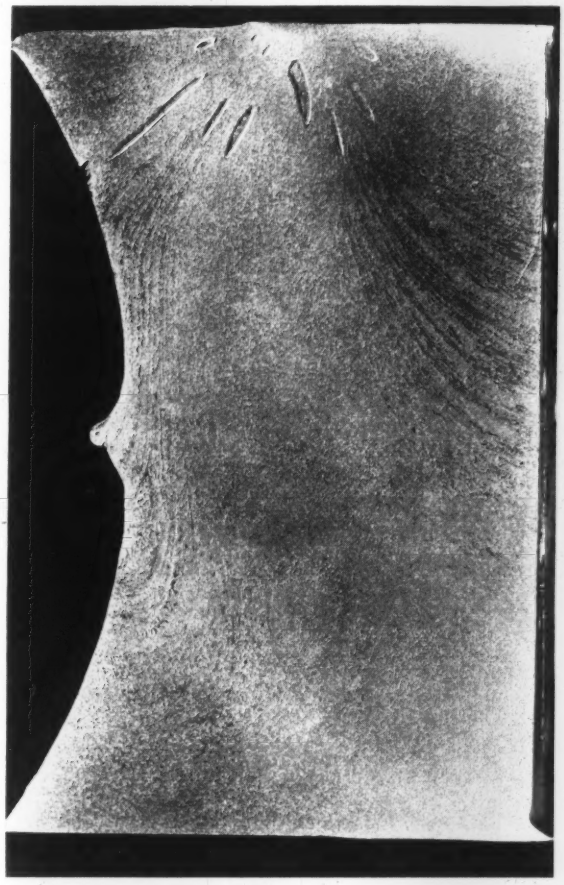
The first springs produced from cross-extruded wire (SAE 6150 chromium-vanadium alloy steel) passed initial 150-hour tests. Complete confirmation of the method will depend on a long range service test in progress. The springs have been in operating aircraft for six months, and not one has failed.

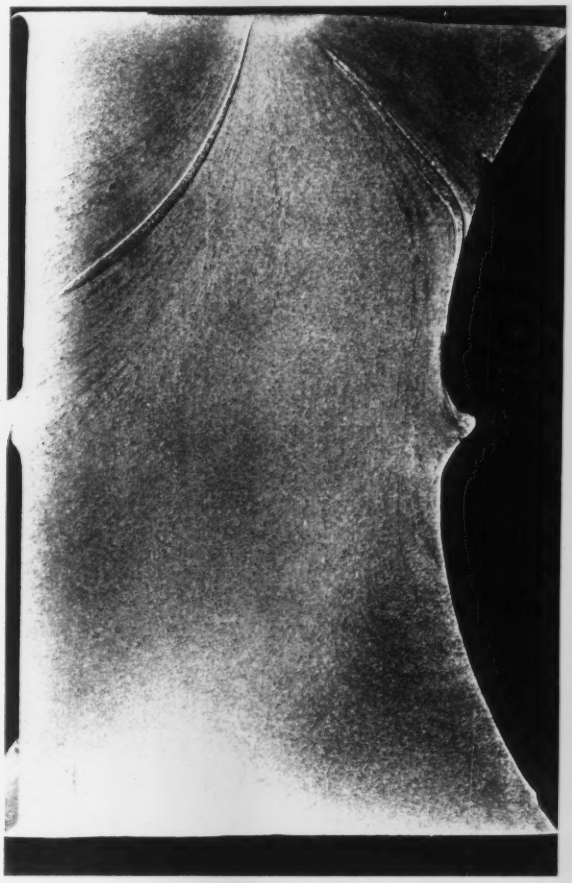
In other applications on tests, preliminary results indicate an amazing increase in spring life, states John F. Murphy, chief production engineer at Curtiss-Wright.

• **Principle Behind It**—Cross extrusion is similar to forward extrusion, except the wire leaves the die at 90 degrees to the direction of the applied force. The additional breakup of the normal directional flow lines improves mechanical properties.

A reduction ratio of 100 to 1 is used to extrude the billet. Length of the billets depends on the speed and tonnage of the press, and the hot working characteristic of the materials.

• **Equipment in Use** — Curtiss-Wright uses a 1000-ton vertical press for experimental production. Tooling is designed for maximum





To demonstrate metal flow in cross extrusion, Curtiss-Wright engineers drilled longitudinal holes in a brass billet and inserted copper rods. Then the billet was cross extruded. The photos above are halves of the unextruded butt (turned on their sides). The protrusion in each curve is the end of one of the rods. The remainder of the rod is indicated by the flow lines converging toward the top of the photo. It shows the flow of metal to the die opening. The hemispherical end on the billet was one type of arrangement that has been used as the bottom of the container

strength and rigidity, so it can handle the anticipated stress level of 160,000 psi.

Dies are made of cast Rexalloy which has a hard, wear-resistant surface and the strength necessary to withstand the high container pressures. Thermostatically controlled gas burners heat the container. A coiler attached to the outlet of the press makes handling of the extruded wire easier.

• **Wire Specifications**—The wire produced is 0.410 in. in diameter. Tolerances are plus or minus 0.007 in. Ovality is within 0.015 in., and the finish is about the same as hot-rolled standards. Depth of decarburization measures less than 0.001 in.

Mechanical properties are improved. Impact strength increases 128 per cent in the transverse and 110 in the longitudinal direction. Transverse elongation improves 38 per cent and longitudinal is up 11 per cent.

• **Future Looks Good** — Several factors encourage the development of the process. Tool costs are low. A low grade of material may be cross extruded to make a product that is equal to or better than a forged or rolled product.

Several phases of the process must be improved before it is competitive with other mass production methods. For example, the billet is now placed in the press with tongs.

When the process is refined, other parts may be produced. Tests indicate that the tool life of cross extruded tool steel is 50 per cent longer than that of conventionally processed material.

• **Many Materials Adaptable**—Other materials have been cross extruded to determine technical and economic feasibility. Some of these are SAE 4130, 300 series stainless, 400 series stainless, high speed steels, copper, brass, bronze, aluminum, and titanium.

In general, the process is too costly for many applications where conventionally produced stock is satisfactory. But many specialized alloy applications look promising. Mr. Murphy explains: "It will serve as a high quality specialty item, giving designers a better material for crucial applications."

How We Beat the Cost Crisis

Direct Labor Costs Cropped 54% by Integrated Cupola Charging

OLD METHOD

Hourly Direct Labor Cost

CHARGE DECK Four men at $1.65 an hour each	$6.60
CRANE OPERATOR	1.71
CRANE HELPER (half time)	0.83
Total	$9.14

Direct Labor Cost per Ton $0.76

At 12 tons an hour

NEW METHOD

Hourly Direct Labor Cost

CHARGE DECK One man automatically loads coke and limestone and runs cupola charge crane.	$1.65
CRANE OPERATOR	1.71
CRANE HELPER (half time)	0.83
Total	$4.19

Direct Labor Cost per Ton $0.35

At 12 tons an hour

An investment of $27,550 is recovered in the first three years. This article, which shows how aggressive cost cutting can pay off, is one of the top entries in the Cost Crisis Awards Competition. Another will appear in next week's issue

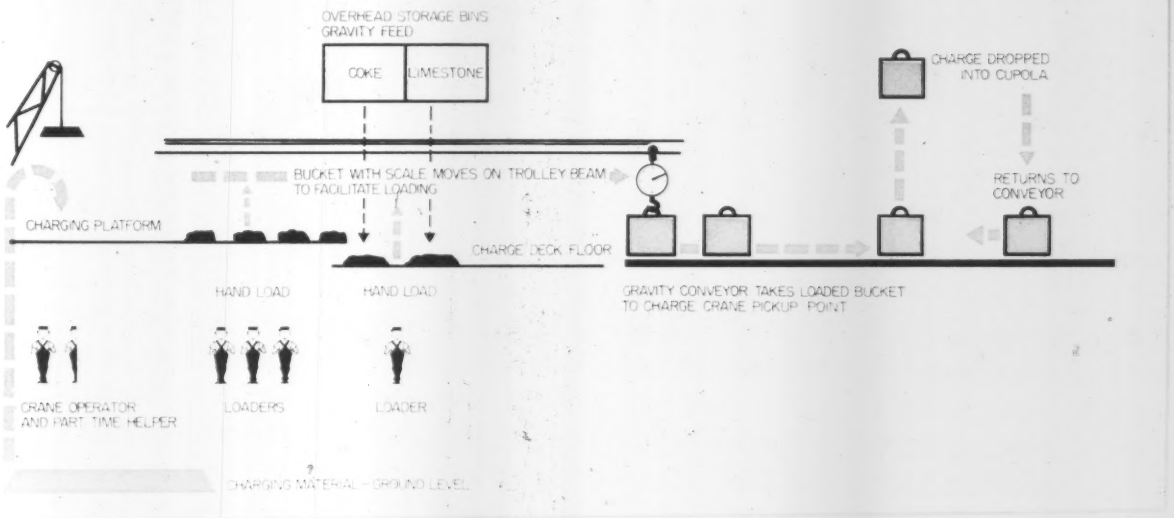
MOST cost cutters figure that all hand production operations are open to suspicion. In the drive to boost the productivity of high-cost labor, mechanization of the "muscle" jobs often makes a good starting point.

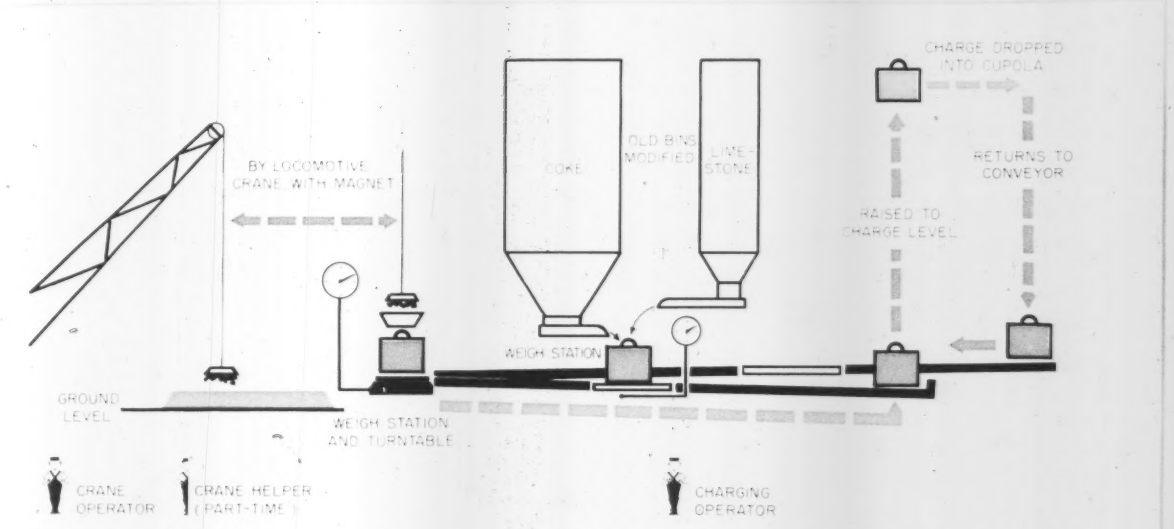
That's the way it worked at General Foundry & Mfg. Co., Flint, Mich., where plant engineers used a touch of automation in cupola charging. It had these results: 1. Saved 41 cents direct labor cost on every ton of iron melted. 2. Boosted the quality of the pour. 3. Raised the melting capacity of the line. 4. Improved safety and working conditions.

Here's how they did it:

• Old Way—All charges were made up in drop-bottom buckets on the charge deck of the cupola. A locomotive crane in the yard kept the charge deck bins supplied with material—filling them during the off shift and replenishing as necessary during the charging shift.

On the charge deck, buckets hung on portable scales suspended from a monorail. As the buckets





were hauled past the material bins, workmen loaded them by hand. To maintain any melt rate over 10 tons an hour, the system required four men on the deck, a crane operator, and a part-time helper.

• **New Way** — The charging machine operator now releases an empty bucket (by remote control) to roll down a conveyor to a turntable. When the bucket is on the turntable, the crane operator loads metal through a charging cone that acts as a funnel. The operator watches a large scale dial to get the right amount of stock in each bucket.

When metal loading has been completed, the charging machine operator releases the bucket to a roller conveyor that takes it to a second loading station. There he feeds coke or limestone from overhead bins via conveyor belts. He can control the amount of each material that goes in by watching a scale dial. He also can load small quantity items like spiegeleisen and briquettes.

Next, he lets the bucket roll to a pickup point where he hooks it to the monorail charger. He also has complete control of the charging cycle, including the return of the empty bucket to the starting point.

W. Arthur Coakes, plant engineer, tells STEEL the charging system operator, the crane operator, and a part-time helper maintain a higher, more accurate melting rate with the integrated cupola charging system than was possible with the old method.

A large cast steel platen represents the successful use of good casting techniques

Casting Tears Slashed

This firm reviewed and applied known corrective foundry practices when welding time per piece rose to 50 hours. Result: Repairs plummeted to 1 hour per unit

IN THE production of eighteen 27,000-lb press platens, 50 welding hours were spent on each of the first three castings. The last six took little more than 1 hour each.

How was it done? Through review and use of known corrective procedures for the reduction of hot tears in susceptible, large steel castings. Five advanced techniques that are practical for any foundry were put to work:

1. Sand that absorbs expansion.
2. Multiple gating of correct thickness.
3. External 1 x 6 in. chills.
4. Favorable design.
5. The most favorable carbon content in the metal.

National Supply Co., Torrance, Calif., was responsible for casting design of the 18 ft long, 7 ft wide, 22 in. deep (at the center) piece. The ribs were 1 in. thick and the bottom plate 1¾ in., allowing ¾ in. for finishing.

The job was an entire core assembly with 20 large cores set in a pit. With platens produced in lots of six, the cores were set on a concrete slab tilted about 10 degrees for pouring.

The gate was placed down and the casting poured uphill to avoid covering the entire drag with metal as it entered. This protected the cope from spalling.

• **Cooler Pouring Helps**—Pouring temperature was originally 2950° F, but satisfactory results were obtained at 2850° F. Experience with large castings has indicated that the cooler the pour, the less cracking takes place. Lower temperature also prevents the sand from burning in.

Large cracks at all ribs of the first casting resulted from the use of 12 per cent silica flour sand in the casting pockets (backed by wood flour, a cellulose material.) The cracks were reduced by using sand with wood flour only.

Large cores are often overrodded in an attempt to prevent core breakage. But core rods and gaggers in the cope promote cracks because of expansion. This amounts to 0.1 in. per foot at 1200° F.

Gate thickness in relation to casting contact thickness is important. When a gate is thicker, the casting usually has cracks at contacts. Cracks are also caused by a concentration of heat at the gates. By increasing the contacts from one or two (on a large piece) to eight, the heat is spread.

The gate may have to be repositioned to reduce concentration of hot metal. Cracks were eliminated on the National job by placing 1 in. diameter chills 6 in. long at the corners on the gate side.

• **Most Effective of All**—Increasing the carbon content of the steel from 0.23 to 0.40 effected the most marked change. Welding time per casting was about 20 hours before this change was made. The first piece poured with the new steel had no cracks.

In making the last six castings with higher carbon steel, total welding time was 7¾ hours (three required no welding). Most of this time was spent where a head was cut low.

New Alloy Weldable

It needs no heat treatment to prevent cracking. Useful for continuous service to 1200° F

WELDING problems with metals that are useful for highly stressed parts at elevated temperatures may be solved by a new air-hardening, fully martensitic alloy.

Known as Carpenter 404 alloy, the material is designed to be free from weld cracking without preheating or postheating. Weldments can be readily cold worked after stress relieving or annealing.

• **Applications**—The steel was developed by Carpenter Steel Co., Reading, Pa. It is recommended for uses such as steam turbine buckets, blades, and bucket covers, as well as for "casting in" assemblies like turbine diaphragms.

The material is a 12 per cent chromium, 1.5 per cent nickel composition that has relatively high tensile strength and good ductility. Carpenter says it shows a marked improvement in weldability over Type 410 stainless, and a more uniform structure and higher hardness than Type 405.

In the annealed condition, the steel is easily blanked, drawn, formed, or cold headed. Another advantage cited by Carpenter is easy machinability in both the treated and annealed conditions.

• **Resists Corrosion**—The metal resists a wide range of corrosives, including the atmosphere, fresh water, mine water, steam, carbonic acid, crude oil, gasoline, perspiration, alcohol, ammonia, mercury, soap, sugar solution, and other reagents. It has good resistance to scaling at elevated temperature and can be used for continuous service to 1200° F.

The alloy is made by the company's Mel-Trol process, a quality control system with patented ingot design. Mel-Trol is used to minimize the causes of inconsistent center line quality which often causes erratic service in alloys of this type.

Carpenter 404 is available in forging billets; hot rolled bars and forgings, annealed or heat treated; cold drawn and ground bars; wire and wire rods; and strip, annealed or tempered.

Plastic is easily stripped from metal parts and then melted for re-use

Plastic Masking Aids Platers

A well-tested work horse in the protective coating field is effectively trimming the cost of preparing metal parts for bath. It's fast drying and easy to remove

PLATING TIME and labor costs have been substantially reduced by substituting a butyrate peelable plastic for conventional lacquers: The plastic dries quickly, can be removed easily.

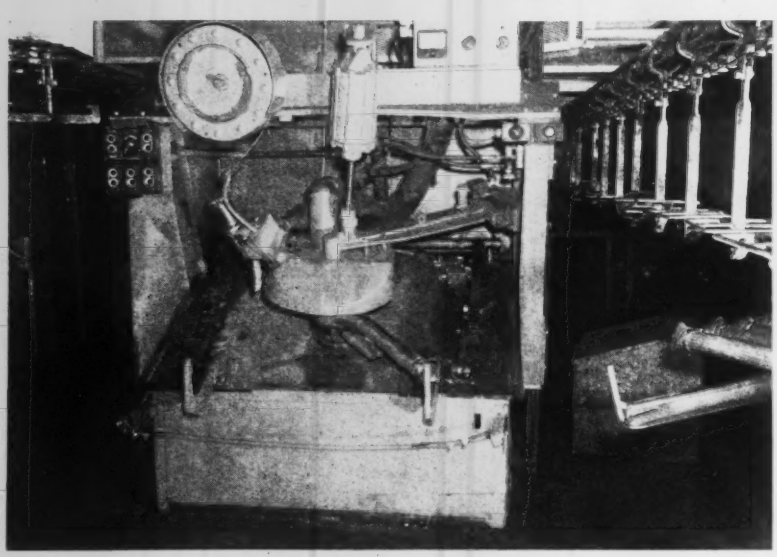
Parts are dipped into the molten plastic, which solidifies within a minute after the parts are removed. After plating, the plastic is peeled off for re-use.

A two-step job carried out by United Platers Inc., Detroit, involved selective plating of an aircraft wing control lever. Specifications called for complete cadmium plating except for six bearing surfaces (these were to be lead plated).

The bearing holes were plugged with the composition. After plating with cadmium, the plugs were removed and the entire part was dipped into the plastic. The bearing holes were then trimmed and the part was immersed into the lead plating bath.

The coating, called Seal-Stop was developed for plating by Seal-Peel Inc., Royal Oak, Mich. Butyrate is supplied by Eastman Chemical Products Inc., subsidiary of Eastman Kodak Co., Kingsport, Tenn. It is nonexuding, does not contaminate the plating solution, and does not leave any residue.

Other uses include protective packaging, used as a potting compound, and as a mask in painting.



Fixture is in position with hood over rear axle housing which turns as weld is made. Cams guide the arc over a noncircular route. One operator runs two machines like this one

Automaker Welds at 150 ipm

Process features hollow electrode which holds flux. It is faster than submerged arc and improves quality of high speed welding needed in auto production

AUTOMAKERS are getting 150 ipm welding speeds from a machine that joins dust caps to rear axle housings in about 14 seconds.

The process (Lincoln Electric's Innershield) uses a flux-filled electrode that works exceptionally well on light gage steel.

• **Part Thicknesses**—The dust cap is joined to the axle housing with a weld that is 33 in. long. The cap is about 0.090 in. thick; the housing is 0.25 in. thick.

The submerged arc method was previously used. Conversion required replacement of the head, controls, and a motor-generator which supplies an output more suited to the process. Turntable speed was increased and a hood added to protect the operator.

• **Operation**—Housings arrive by conveyor. The operator loads the part onto the fixture, inserts a dust cap, and lowers the head and hood over the work. The arc starts automatically.

The head follows the noncircular seam through a cam arrangement as the table turns. The completed part moves to the unloading position at the machine front after the head and hood **retract.**

During operation, some of the ingredients in the electrode vaporize on contact and provide a shield that protects the arc. Other components flux and deoxidize the weld. The process doesn't require any other gas or flux.

One auto firm has six machines. Each operator runs two.

The welding process also joins flanges to the housing and lays a reinforcing bead on the inside of the seams which run the length of the axle.

Sketches Cut Work Time

By adding detail sketches to work routing orders, Baker Perkins Inc., Saginaw, Mich., has been able to halve the time required for layout drilling and tapping on large sheet and structural metalwork.

Under the old system, a complete blueprint accompanied each job through the plant. The workmen had to pore over the prints to find the particular operations they were supposed to perform. That ate up working time and sometimes resulted in errors because they were not familiar with all the changes and specifications on the prints.

Now, each man can see quickly what operation he is to do.

Since many of the initial operations are routine, and are repeated many times with only minor variations, Baker Perkins has printed a series of sketches for such items as angles, channels, and I-beams. On the initial job routing sheets, the specifications and information are printed on the sketches which are attached to the work orders as they go out into the plant.

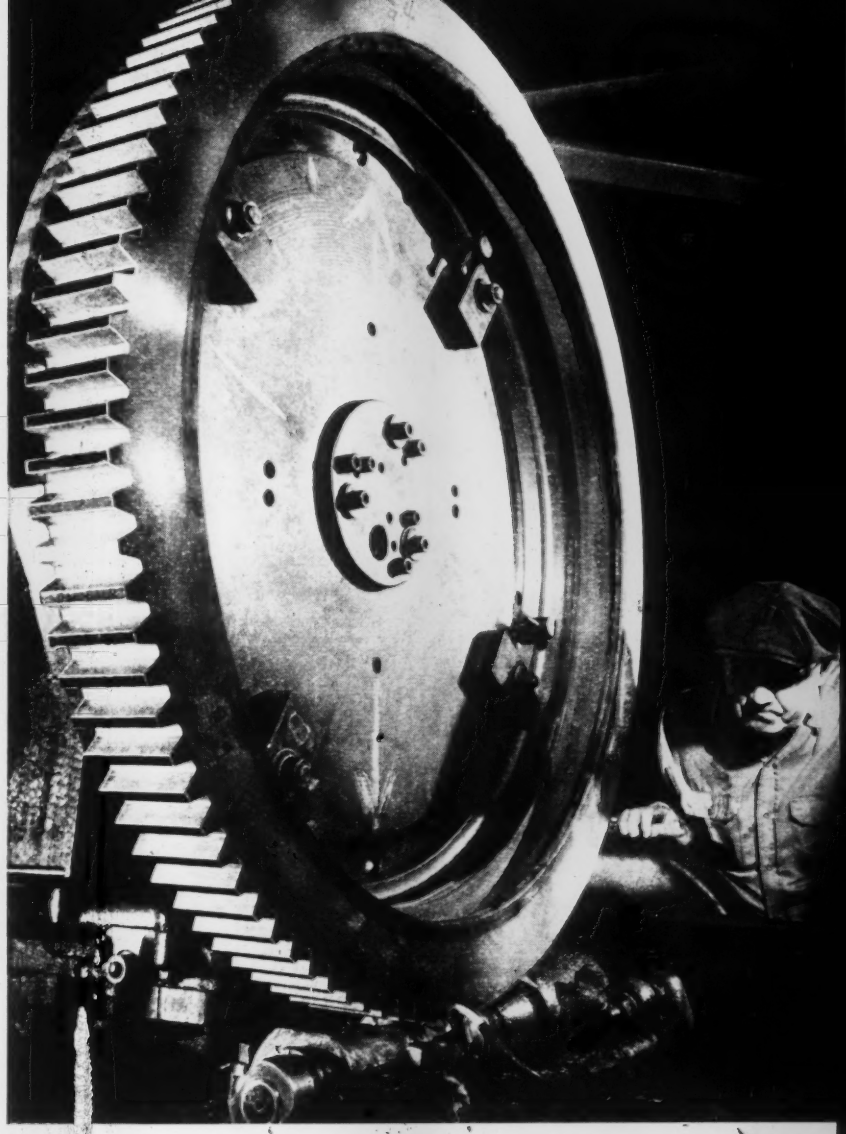
Aluminum in New Market

Development of distribution transformer housing made easily from aluminum extrusions represents a breakthrough into a new market for the light metal that may total 25 million lb a year.

Reynolds Metals Co., Richmond, Va., which has pioneered other profitable markets for aluminum, says the tanks weigh one-third less than their steel equivalents. Officials point out that the lighter weight will make installation of transformers on poles easier, safer, and more economical.

The extruded sectors, which have readymade fins for dissipating heat, are applicable to 25 kva and larger transformer sizes. The extrusions have lifting lugs, hanger attachments, and core and coil supports.

Reynolds also claims economy in maintenance costs as well as in manufacture. The total savings offered in fabrication and use of the aluminum housings will bring overall costs in line with those of conventional steel housings, the company says.



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ALCO's *regular forgings offer many opportunities for cost reduction in machine set-up and tooling.*

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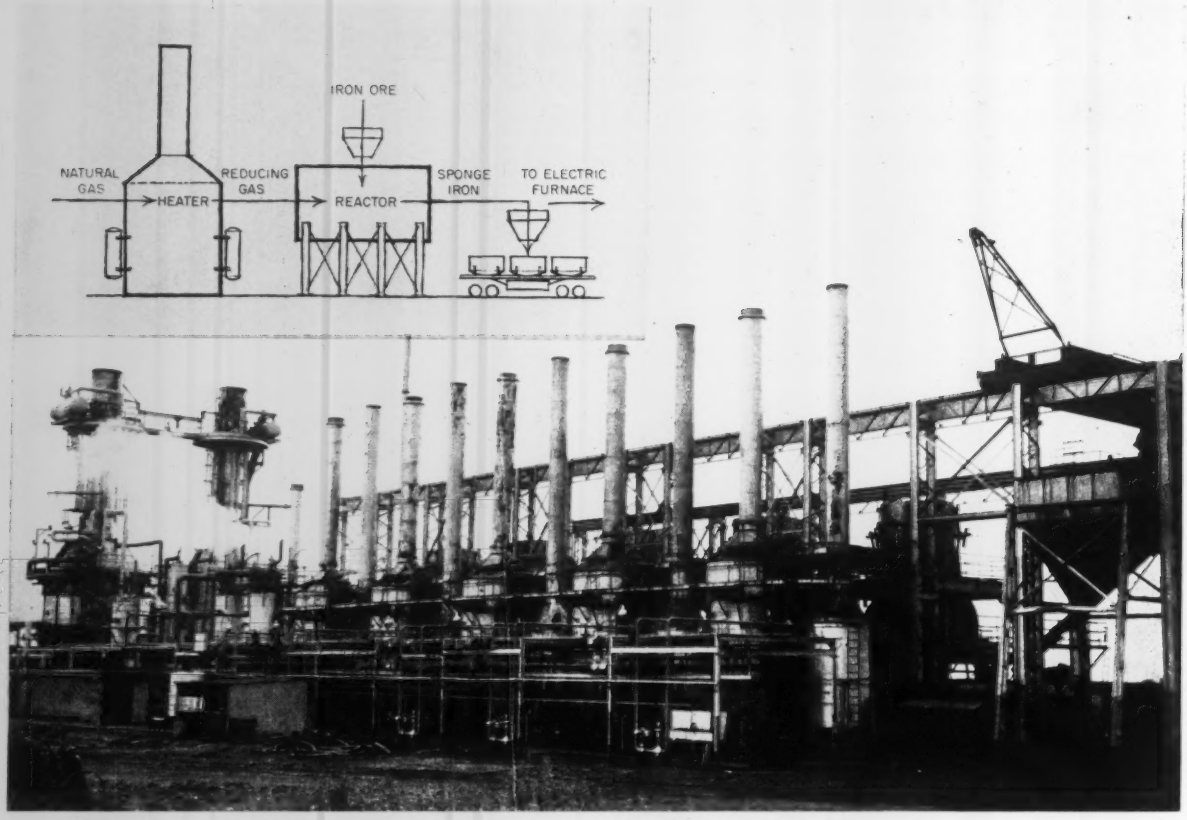


HyL sponge iron plant at Fierro Esponja, Monterrey, Mexico. Gas reforming furnaces are at left, reactors in the center, and ore loading hopper and conveyor system at right

Here's Direct Reduction Process for Small Plants

It offers specialty steel producers a means of integrating production without an enormous investment. Ore is changed to sponge iron by reacting it with a reducing gas

DIRECT REDUCTION of iron ore to sponge iron that can be charged into an electric steelmaking furnace is now commercially practical.

Developed by Hojalata y Lamina S. A., one of Mexico's principal steel producers, with engineering assistance from the M. W. Kellogg, Co., New York, the process has been proved in production at a 200 ton-per-day plant operated by Fierro Esponja S. A., Monterrey, Mexico.

• **Significance**—The HyL process offers specialty steel producers a means of integrating production facilities without building a blast furnace.

It also may be a boon for areas which have rich deposits of ore but lack abundant coking coals or limestone.

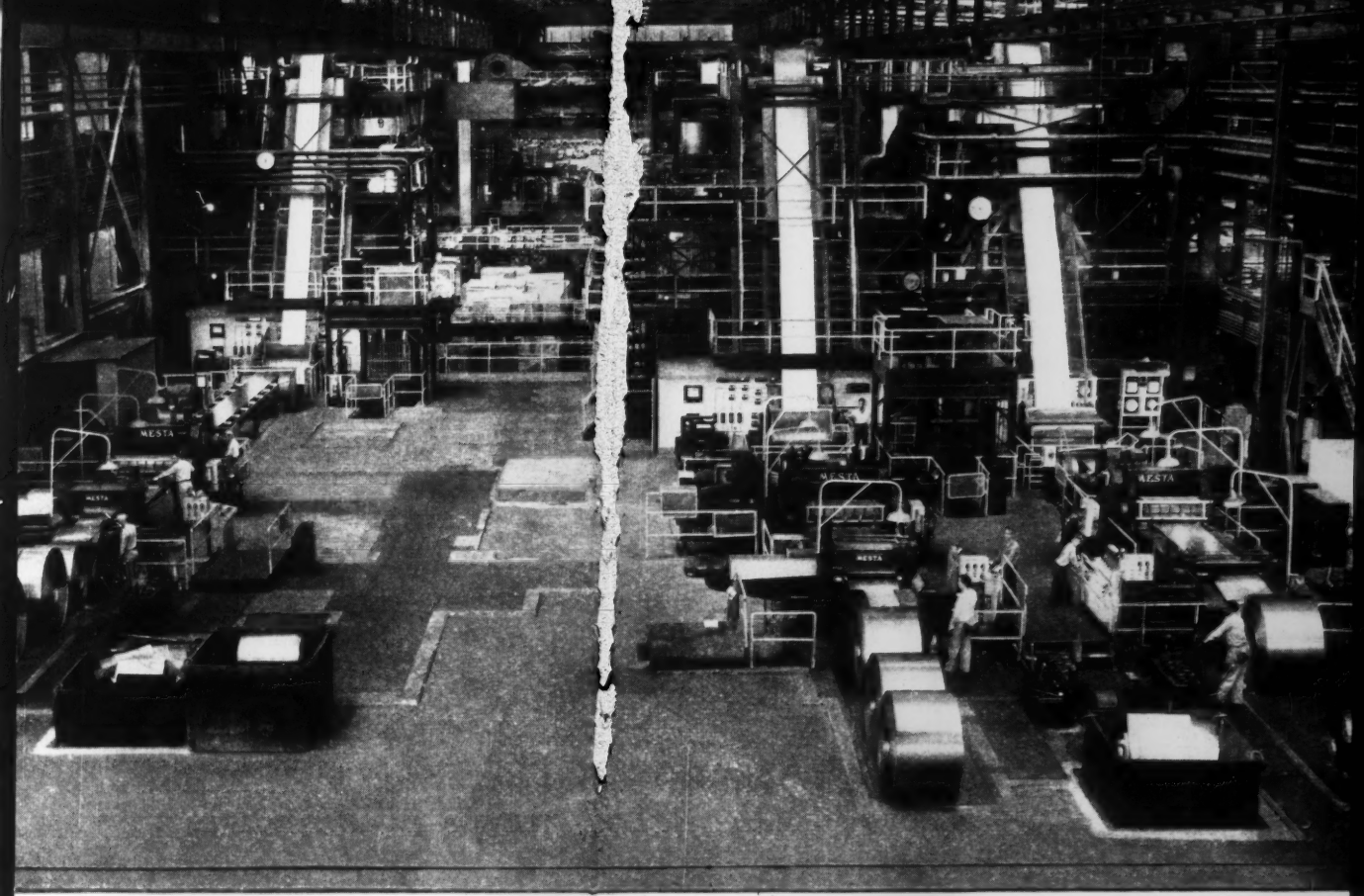
The facility (reducing atmosphere equipment and reactors that make the sponge iron) doesn't take as much of a capital investment as a conventional steel plant, and it can be built on a smaller scale.

Ores with a high percentage of fines (difficult to handle in normal blast furnace operation) may be reduced to metallic iron and briquetted, then sold as high quality metallic feed.

• **Reduced with Gas**—In the Fierro Esponja plant, Durango hematite ore is reduced in fixed bed, batch type reactors by direct gaseous reduction. Average ore analysis (percentage by weight):

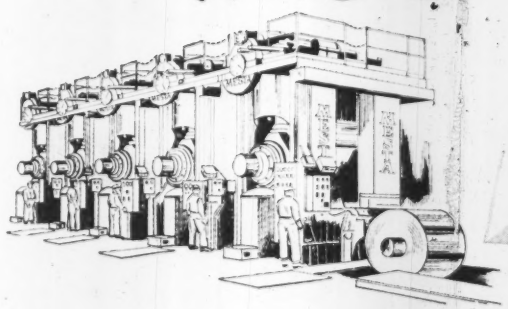
Insoluble	4.500
Iron	66.600
Phosphorus	0.008
Sulfur	0.020

The sponge iron is charged directly into electric furnaces in place of pig iron or scrap. (The Mexican steelmaker says the steel is of highest quality.) One analyisis of reactor-produced sponge iron:



THREE MESTA 48" CONTINUOUS GALVANIZING LINES WITH FEED REELS, AUTOMATIC MASH WELDERS, TENSION REELS, AND ROTARY FLYING SHEARS WITH LEVELLERS.

Continuous galvanizing lines

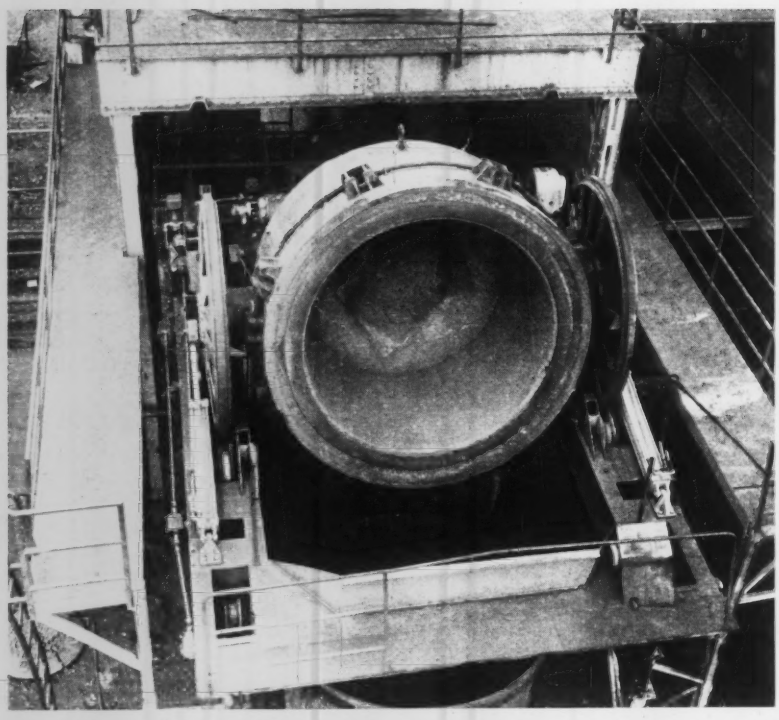


Designed and Built by MESTA

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



One of the five reactors, each of which holds 30,000 lb of ore. After the ore has been reduced, the reactor is dumped

Metallic iron	86.000
Total iron	90.000
Per cent reduction	95.550
Carbon	0.620
(can be increased to 2%)	
Sulfur	0.070
Insoluble	8.000

The reducing atmosphere is about 85 per cent hydrogen and carbon monoxide. (Remainder is carbon dioxide, methane, and water vapor.) It is obtained from natural gas which is desulfurized, then passed through a Kellogg, high-pressure-steam reforming furnace. The reducing atmosphere also can be made from petroleum.

• **Reaction Cycle 4 Hours**—Five reactors using the HyL process are in operation. The reaction cycle requires 4 hours with an additional 30 minutes for dumping and charging.

At any moment, each reactor is at a different stage in the cycle, making it possible for one labor crew to operate the facility. A reactor is dumped every hour.

• **Reactor Charge**—Ore ¼ to 1½ in. in size is charged into the reactors. In the 200 ton-per-day plant, each reactor holds about 30,000 lb of ore. About 21,000 cu ft of natural gas are required per ton of reduced ore.

Final ore reduction takes place within a range of 1600 to 1900° F. The reduced product retains the approximate size of the charged ore but becomes porous. The hot sponge is discharged from a reactor to a hopper for transportation to a melting furnace.

Of the total product charged into the reactors, about 85 per cent is discharged as metallic iron, representing removal of 90 per cent of the oxygen in the ore.

• **Larger Plant Planned** — The Kellogg company, a subsidiary of Pullman Inc., is the world-wide and exclusive sales and licensing agent for the HyL process. It did much of the engineering on the present plant, and it will engineer and build a second plant for Fierro Esponja with a 500 ton-per-day capacity.

The larger plant will have substantially lower utility requirements, improved thermal efficiency, and improved operating economies, say Kellogg engineers. Improvements in the mechanics of operation which greatly simplify material handling will be incorporated in the larger plant.

Kellogg's estimates of utility needs:

Natural gas required	
cfh	353,000
cf/ton of iron	16,900
Net steam make	
lb/hour	2,900
lb/ton of iron	139
Circulating cooling water	
gallons/minute	4,300
gallons/ton of iron	12,400
Electricity	
kw-hr	220
kw-hr/ton of iron	10.5
Capital investment	
dollars/annual ton of iron (based on Gulf Coast plant site)	33

• **Future Looks Good**—Far larger plants are practical. Here's an estimate of operating costs for a 1000 ton-per-day plant (dollars per ton of iron) in the Gulf Coast area:

Iron ore (1.76 tons @ 58% Fe)	24.40
Gaseous reducing media	2.02
Fuel	1.47
Water	0.12
Steam	0.71
Boiler feed water	1.79
Power	0.08
Steam credit	−0.64
Fuel credit	−1.25
Labor	0.53
Total production cost	29.23
Maintenance and capital charged at 20% of plant cost	5.20
TOTAL	34.43

In the new 500 ton-per-day plant, five reforming furnaces will supply the reducing gas. Reduction will take place in four reactors, each of which will hold about 105 tons of ore. The plant will be engineered to utilize the heat content of the reformed gas and the reduced ore.

The sponge iron will be cooled after reduction. That will bring about additional saving by eliminating the need for special equipment and procedures to handle metals at high temperatures.

When ready for discharge from the reactors, the iron can be sent directly to the electric furnaces or can be stored for later shipment to steel plants. Reoxidation of the sponge iron is no problem.

BROWNHOIST TOWER
unloads 540 tons of coal per hour!

Designed and built to unload coal from barges to a power plant on the Ohio River, this Industrial Brownhoist stationary tower crane achieves a production rate of 540 tons per hour! Barge hauls move barges to proper location underneath unloader and coal is transferred to 100 ton bin built into the tower and then fed on to a belt conveyor to the plant. All motions are controlled by operator from one position in operator's house which is pressurized with clean air provided by a blower.

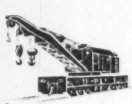
The tower, with a 6-ton rope system, is fixed to a concrete cell and is of all-welded construction. Erection joints are fastened with high strength bolts. A pillar crane is fixed to the tower to service electrical and machinery parts in the machinery house.

Industrial Brownhoist designs and builds specialized equipment like this tower in any tonnage and capacity for handling any material at sea ports, steel mills, ore and coal docks and railroad yards throughout the world. For more information on reliable high speed, high capacity material handling equipment, write for catalog 562.

209

BROWNHOIST

CLAMSHELL BUCKET



250 TON WRECKING CRANE

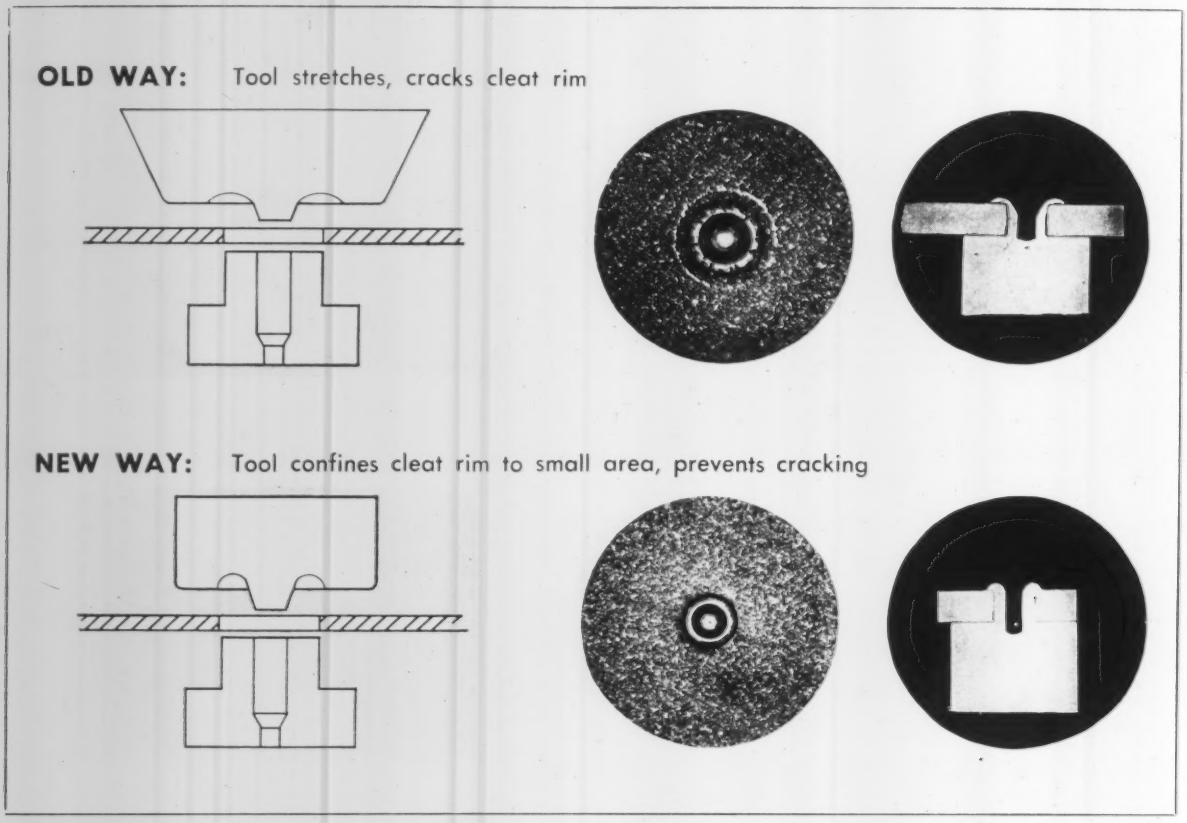
COAL-ORE BRIDGE

CAR DUMPER

LOCOMOTIVE CRANE

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: Cleveland, Philadelphia, Chicago, San Francisco, Montreal.

• **AGENCIES**: Detroit, Birmingham, Houston



Modified Cleating Tool Trims Cost

A simple change in profile reduces stretching and prevents cracking at the rim of the cleat. Savings result from elimination of heat treatment and extra machining

CLEATING by an improved method, using a newly designed tool, promises greater strength and better appearance in metal-to-metal joints.

Developed in the radio factory of Philips Incandescent Lamp Co., Eindhoven, Netherlands, the method eliminates cracks in the rim of the cleat from severe deformation, H. E. Deelman reports in the *Philips Technical Review*.

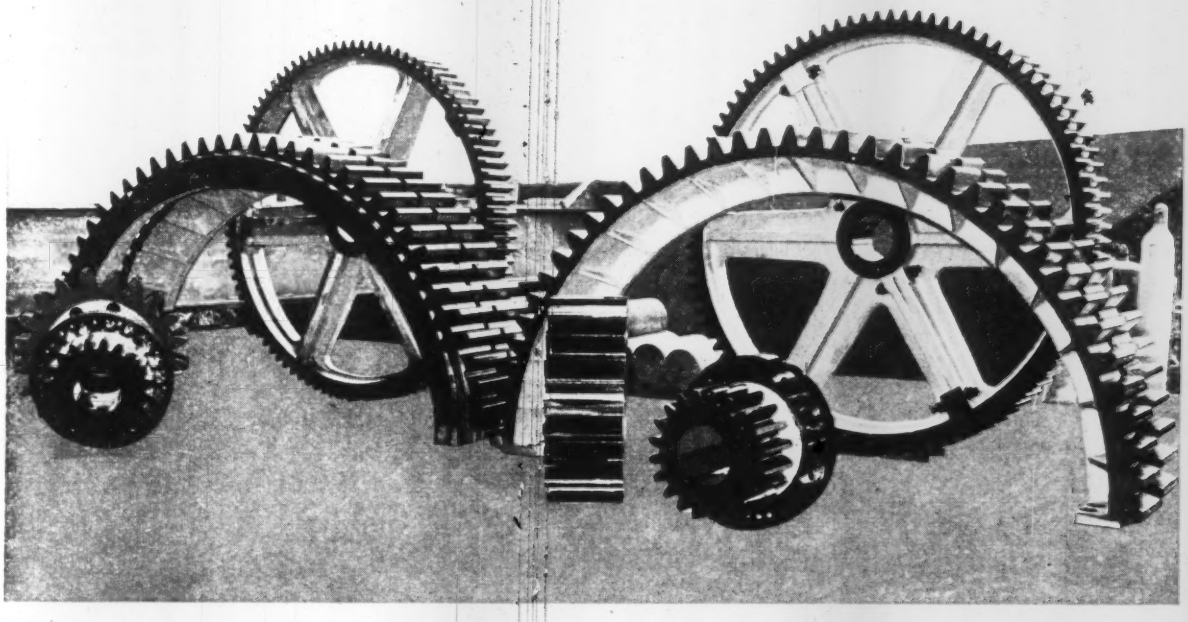
The new tool holds the rim closer to the center. That reduces the degree of deformation or stretching around the outer rim . . . the tool is applied. A thicker rim also improves the strength and appearance of cleated joints.

• **Two Cleating Methods**—In two conventional methods, the cylindrical end of the cleat is pushed through a hole in one or more metal plates, then forced outward with a special tool. In one method, the tool presses downward on the entire circumference of the cleat rim at one time; in the other, a spinning tool, which contacts only two points on the cleat rim at one time, is used.

Cleats made from steel, brass, or aluminum bars machine better after hardening.

When those metals are hardened by cold working, ductility is reduced and the rim tends to crack when it is stretched.

• **Annealing Costly** — To prevent cracking with conventional tools, cleats can be annealed. (Some deformation occurs and the cleats must be machined or ground to assure proper fit.) The cost of annealing and extra machining makes the cleating operation an expensive one.



large cast steel gears to your designs and specifications

by AVONDALE

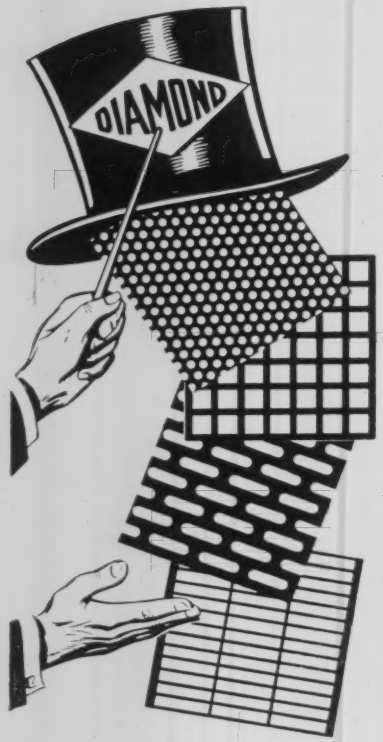
Avondale's Service Foundry Division manufactures cast steel gears (plain or alloyed) to 15' diameter and 30" face. Gear teeth are cut without limitation to tooth form or size on Service Foundry's large Gleason gear planer. Cast tooth gears are also manufactured regularly. For your next gear order, consult Service Foundry NOW! Write for our illustrated brochure, *Foundry Work — Steels, Alloys & Non-Ferrous, Vol. 6.*

AVONDALE

MARINE WAYS, INC

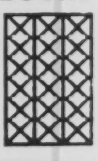
VERSATILE BUILDER ON THE MISSISSIPPI

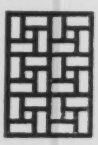
P. O. BOX 1030 • PHONE UNiversity 6-4561 • NEW ORLEANS 8, U. S. A.

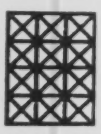


Top-Hat Quality IN Perforated Metal

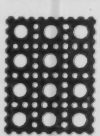
The popular Diamond Perforated-metal patterns shown above are only a few of the many illustrated and described in our 32-page Catalog No. 39. All of these standard patterns are available in a wide range of unit-opening sizes and we are always equally pleased to quote on original designs of any type or size.







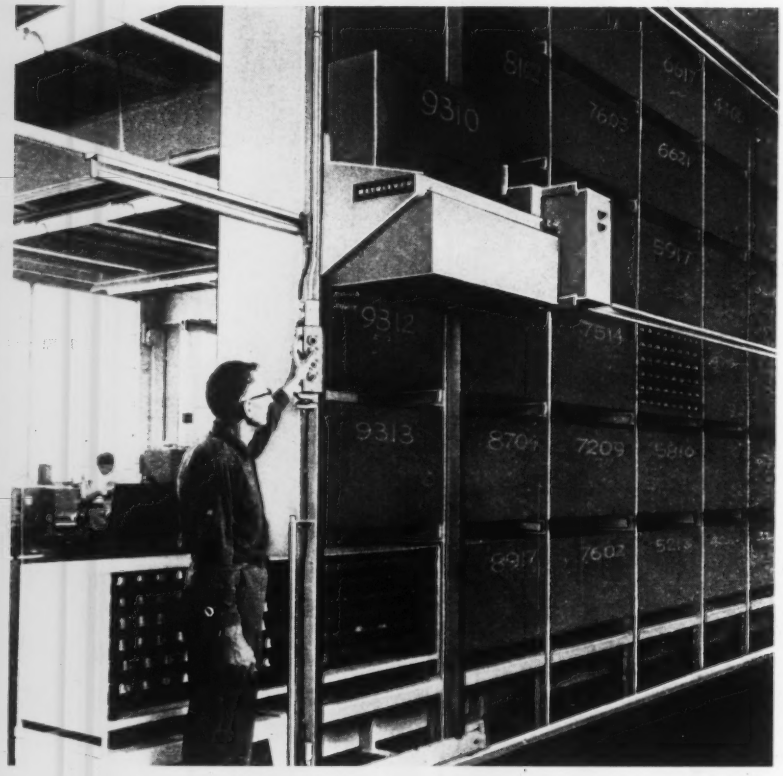
Catalog 39 also illustrates and describes our high-quality lines of *Ornamental Cane*, Perforated-Metal Sheets for Accoustical installations and Heavy-Duty Architectural Grilles. Write, today, for a free copy.



Correspondence is especially invited regarding ANY requirement for perforated-metal panels or parts. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.

DIAMOND MFG. CO.
WYOMING WILKES-BARRE AREA **PA.**

Manufacturers of DIAMONTEX, the Perforated Metal Lay-In panel for better Acoustical Ceilings. New Bulletin No. 47, gives complete information. Write, today, for free copy.



Parts are moved to and from the work area at the touch of a button

Storage Tiered, Mechanized

A MECHANICAL storage wall has been developed by Triax Equipment, Cleveland.

The storage system, called the Retriever, consists of an electrically operated traveling carrier, steel storage drawers, and a compact loading or transfer station. It can move loads of up to 4000 lb to or from any compartment in the wall.

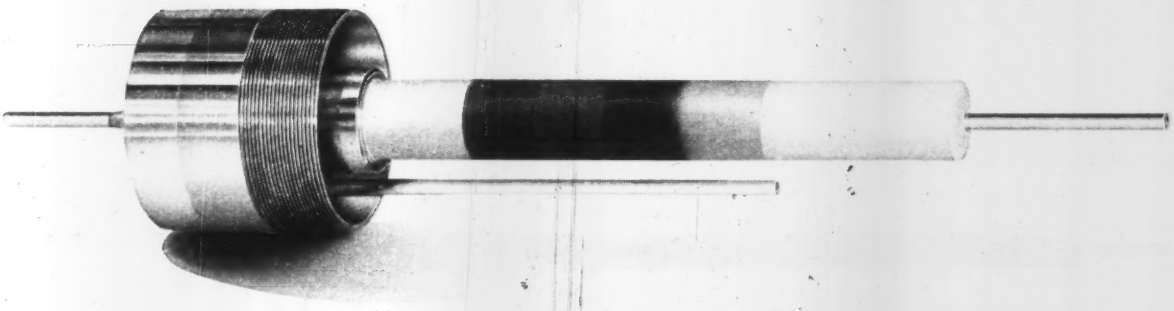
• **Saves Time**—At the touch of a pushbutton, the Retriever picks up a load, carries it to any desired area in the wall, then rolls it gently into a protected and dust-free drawer or compartment. Material is returned to the work area or shipping platform with the same ease and speed. The system saves time formerly wasted in looking for parts or shifting pallets.

• **Saves Space** — The Retriever makes use of plant or warehouse space from floor to ceiling. Compared with conventional methods, it provides up to four times as many cubic feet of storage per square foot of aisle and rack space. This can save the cost of plant additions, George R. Johnson, general manager of Triax, points out. Wide aisles for transportation of material to storage are unnecessary. The wall can be placed to provide neat and quiet separation of work areas.

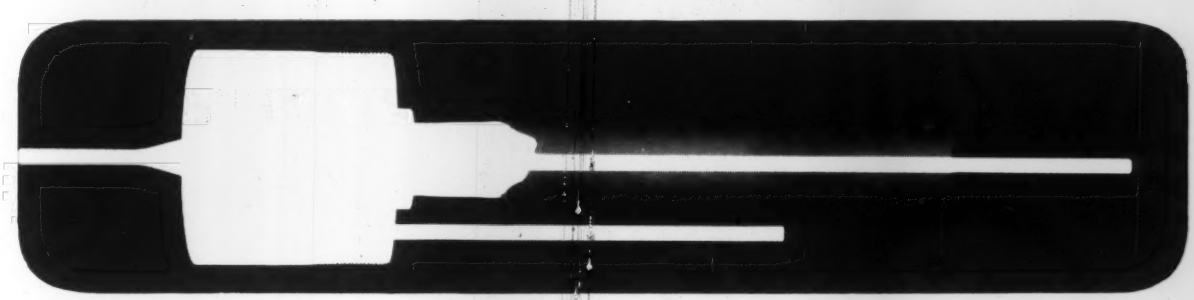
• **Saves Labor**—Labor cost is greatly reduced, since no special operator is needed to move, store, and stock materials.

Because the system has few moving parts, maintenance cost is low.

Seal unit of one of the repeaters of a transoceanic telephone cable.



It has a 20-year job 3 miles under the sea



Radiography reveals no foreign particles or voids in molded areas, shows the ultimate contact of the molded insulation with the central conductor.

Radiography shows the rubber seal and molded parts are ready to take it

EVERY 40 MILES along a transoceanic telephone cable, there is a repeater—an electronic masterpiece designed to boost the message along and made to operate 24 hours a day for a minimum of 20 years.

Any foreign particles in the molded parts of the seal could reduce its performance. And with sea water pressures up to 8000 lbs. p.s.i. to resist, the adherence of the rubber seal areas to the central conductor and outer metal shell must approach perfection.

Radiography assists Western Electric to make sure that each repeater measures up to specification.

Using Kodak Industrial X-ray Film, Type AA, the radiographer can inspect each repeater thoroughly, and quickly. This film has the sensitivity and speed to enable the work to be done even with low-power x-ray equipment.

In all applications, Type AA Film is producing quality work in far less time. It is extending the service of present x-ray equipment, and increasing production with gamma-ray sources.

Have your x-ray dealer or Kodak Technical Representative tell you about it. It saves time and money.

EASTMAN KODAK COMPANY, *X-ray Division*, Rochester 4, N. Y.

Kodak Industrial X-ray Film, Type AA

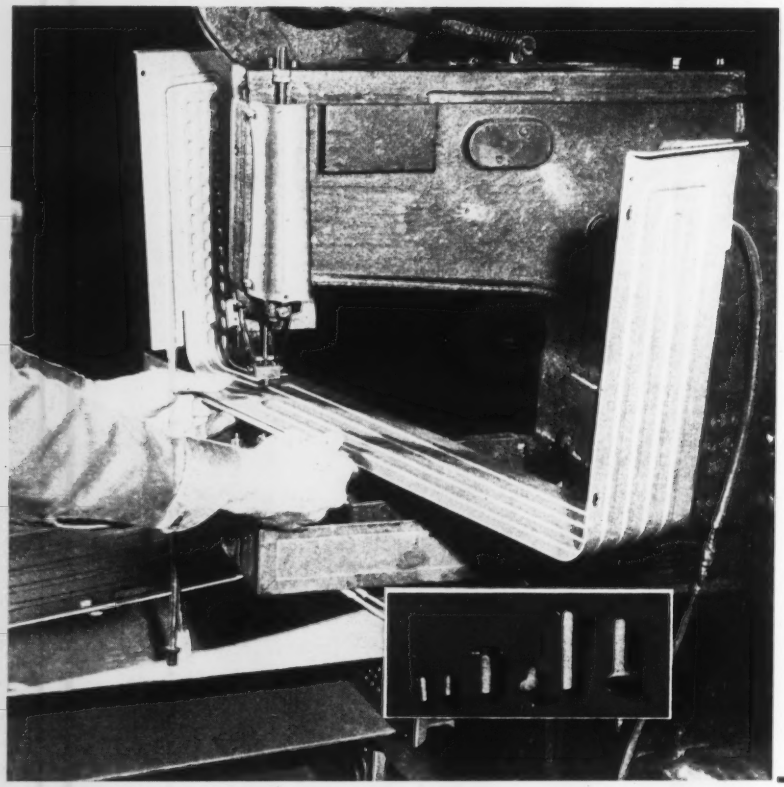
Read what Kodak Industrial X-ray Film, Type AA, does for you:

- Speeds up radiographic examinations.
- Gives high subject contrast, increased detail and easy readability at all energy ranges.
- Provides excellent uniformity.
- Reduces the possibility of pressure desensitization under shop conditions.

Kodak
TRADE MARK

You can improve quality of manufactured products, whittle time and material costs. Other advantages: Uniform appearance, with no staining, no corrosion from electrolytic action

By FLOYD A. LEWIS
Technical Secretary
Aluminum Association
New York



Riveting machine joins aluminum refrigerator components with semitubular aluminum rivets. Inset: Some popular types of rivets

Aluminum Rivets Upgrade Parts Made of Aluminum

First of a Series of Three Articles

This is the first of three articles on the use of aluminum fasteners for joining aluminum structural parts. Next week's article covers the application of aluminum bolts, machine screws, washers, and nuts. The final article will explain how aluminum sheet-metal screws can save time and money in fabricating aluminum sheets and plates.

A TIP for fabricators of aluminum sheets and plates: If you fasten with rivets, use the aluminum type. You can make a better product in less time and at lower cost.

Here's why: Aluminum rivets are easy to work and inexpensive to use. They give aluminum products a uniform appearance, eliminate staining, and prevent electrolytic action, which is caused by the joining of dissimilar metals.

Aluminum rivets are available for virtually every application. Standard types meet all requirements in most joints; many specials are also offered.

• **Choose Compatible Alloy**—The composition of the rivet should be similar to that of the part being joined. Example: Pure aluminum rivets (1100) should be used with products made of pure aluminum, or alloys which cannot be heat treated.

Rivets made of medium-strength alloys (such as 6053-T4) are used with medium-strength alloys that

Aluminum Rivets—Driving, Aging, Shear Strength

Alloy, Temper Before Driving	After Driving	How Driven	Aging Period for Full Strength	Ultimate Shear Strength (psi)
1100-F	1100-F	Cold (as received)	—	11,000
2017-T4	2017-T3	Cold (as received)	—	39,000
2017-T4	2017-T31	Cold (immediately after quenching)	4 days	34,000
2024-T4	2024-T31	Cold (immediately after quenching)	4 days	42,000
2117-T4	2117-T3	Cold (as received)	—	33,000
6053-T61	6053-T61	Cold (as received)	—	23,000
6061-T6	6061-T6	Cold (as received)	—	30,000
6061-T4	6061-T31	Cold (immediately after quenching)	4 months	26,000*
6061-T4	6061-T43	Hot (990 to 1050° F)	2 weeks	24,000
7277-T4	7277-T41	Hot (850 to 975° F)	1 week	38,000

*Value of 24,000 psi reached in two weeks.

can be heat treated, or with cold worked alloys that cannot be heat treated.

In fabricating high strength alloys, rivets should be made of high tensile strength alloys, such as 7277-T4.

• **Heat Treatment**—Rivets made of heat treatable alloys are always sold in the heat treated temper (solution heat treated, or solution heat treated, then artificially aged). Tempers are changed slightly by cold work in driving and by natural age hardening if the rivets have not been aged artificially.

Rivets that have not been heat treated are always driven cold. Heat treated types made of medium-strength alloys may be driven cold but are often hot driven if they are more than ½ in. in diameter. The high strength types are always driven hot.

Rivets that have not been heat treated are always driven cold. Heat treated types made of medium-strength alloys may be driven cold but are often hot driven if they are more than ½ in. in diameter. The high strength types are always driven hot.

Some of the medium strength alloy types drive easier if they are heat treated, then quenched, immediately before driving. After heat treatment, they begin to age harden but drive readily as much as 2 hours after quenching.

If time elapses between heat treatment and driving, rivets should be kept in cold storage to retard age hardening.

• **Types of Joints**—Standard lap and butt joints are used. Selection hinges on the strength and appearance required.

• **Size and Spacing**—Rivet diameter should be no more than three times the thickness of the heaviest part at the joint.

Distance from the edge of the material to the center of the rivet should be no more than twice the diameter of the rivet. Space between rivets should be enough to allow proper driving, but it should be no more than three times the diameter of the rivets or 24 times the thickness of the metal being joined.

Length depends on rivet diameter, hole size, total thickness of material at the joint, and the type of driven head. The right length can best be determined by an on-the-job test.

• **Holes, Sizes** — Holes may be punched or drilled; except in thin material, they should be reamed or shaved to eliminate rough edges which may cause radial cracking.

Holes should be as close as pos-

Aluminum Rivets for Aluminum Structures

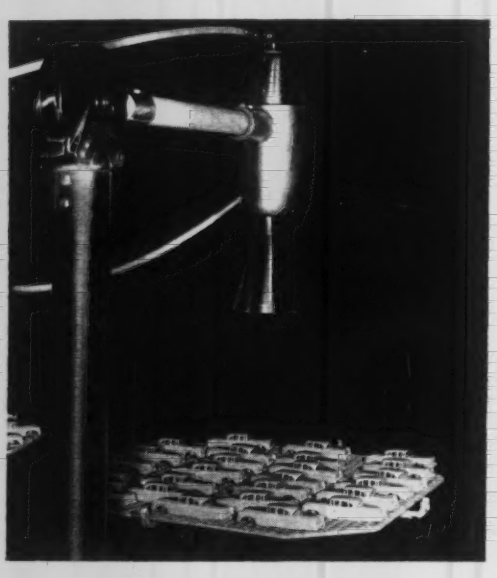
When joining these aluminum alloys—	Use rivets made of these alloys (driven temper):
1100 (any temper), 3003-0, 5052-0	1100-F
3003 or 5052 (quarter-hard or harder)	6053-T61, 6053-T41, 6061-T43, 6061-T31
6061-T4, 6061-T6, 6063-T4, 6063-T6	6053-T61, 6053-T41, 6053-T6, 6061-T6,
2014-T6, 2014-T4, 2024-T4, 7075-T6	6061-T43, 6061-T31, 7277-T41
	2017-T31, 2117-T3, 2024-T31, 6061-T43, 7277-T41

T—heat treated (includes effect of cold work in driving, natural age hardening).
F—as fabricated.
O—annealed.

tootsietoys

are painted by the millions with

RANSBURG NO. 2 PROCESS



Miniature automobile bodies of the tootsietoy line are efficiently and uniformly painted as trays of cars pass below one of the four Ransburg No. 2 Process atomizing bells.

QUALITY OF THE FINISH IS IMPROVED AND PAINT COSTS ARE CUT 65% WITH

Electrostatic Spray Painting

Dowst Manufacturing Co., Chicago, are sticklers for quality in the production of tootsietoys which are turned out at the rate of 25 million a year.

That's one reason they changed from hand spray to Ransburg Electrostatic Spray Painting.

RESULTS? Rejects are cut from as much as 5% to about 1%, for they're getting a more uniform, higher quality coating on all parts.

Colors are changed easily, and paint mileage is stepped up substantially. For instance, on one toy item, a gallon of paint coated only 1800 units by hand spray. Now, with Ransburg No. 2 Process, they paint 5500 pieces per gallon. That's because of the unmatched efficiency of Ransburg No. 2 Process.

NO REASON WHY YOU CAN'T DO IT, TOO!

Whatever your product—whether it's large or small—we'd like to show you what RANSBURG ELECTROSTATIC PROCESSES can do for you in YOUR finishing department. Write for our No. 2 Process brochure which shows numerous production line examples of electrostatic spray painting on a wide variety of products.

RANSBURG

RANSBURG
Electro-Coating Corp.
P. O. Box 7822 • Indianapolis 23, Indiana

sible to nominal rivet diameter, but large enough to permit easy insertion and prevent production delays. Clearance for cold-driven rivets may be from 0.003 in. for thin material to 0.032 in. for material 1 in. thick. Slightly greater clearance is needed for hot driven rivets.

• **Driving Method Optional** — These rivets are driven in the same manner as other types, but squeeze riveters are recommended.

Pneumatic hammers may be used if they are large enough to upset the rivets properly; the right hammer size should be determined by an on-the-job test.

A heavy hammer may be used for heading if the job permits proper bucking.

• **Cone Heads Preferred** — Cone-point driven heads are desirable in all applications, unless another type is required for appearance or some other reason. They accommodate the full tensile strength of the rivet shank, require less driving pressure than full button heads, use less stock, and their appearance is changed little by variations in shank length.

• **Machines Do Faster Job**—Machines which handle rivets up to 5/32 in. diameter and will punch stock as thick as 5/32 in. are often used.

The method has gained popularity in the manufacture of storm windows and doors, household appliances, and other high-volume products.

• **Semitubular Rivets**—This type is well suited to machine or hand riveting. It is available in several designs for blind riveting, where the work can be reached only from one side.

In deciding what hole size to use, it must be remembered that this type does not resist shear or tension as well as solid rivets of the same alloy and size.

The right rivet length can be calculated by adding the clinch allowance to the total thickness of the material joined. It's best determined by test riveting.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

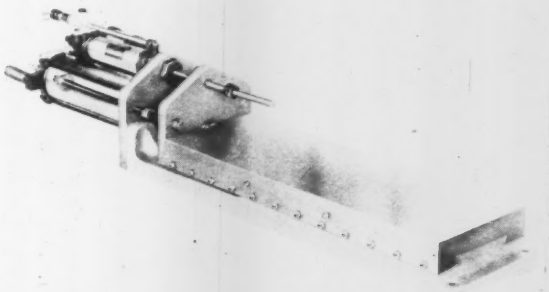
Slide Assembly Package Has Many Extras

This air-powered, heavy duty slide assembly has a smooth, accurate hydraulic feed control.

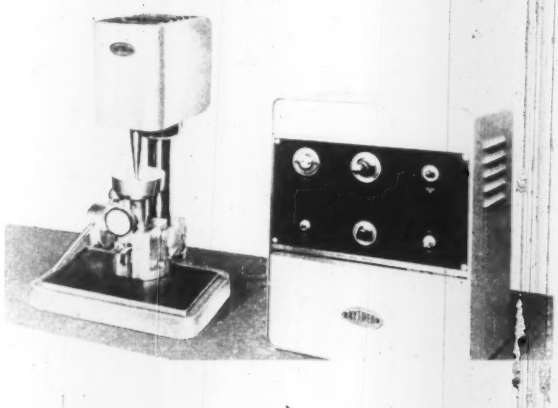
The package unit includes an air control valve for starting the cycle, and two built-in microswitches that permit interlocking slide operation with other machine functions.

They are available from stock in three convenient sizes, with working surfaces of 4 x 12 in., 6 x 16 in., and 8 x 24 in.; maximum stroke lengths of 4, 6, and 8 in.; and maximum feed strokes of 2, 4, and 6 in., respectively.

An adjustable, positive stop screw permits regulating the length of feed stroke. A choice of control arrangements is available. *Write*: Russell T. Gilman Inc., 623 Beech St., Grafton, Wis. *Phone*: 4526



Ultrasonic Grinder Handles a Variety of Jobs



The Model 2-335 ultrasonic impact grinder uses a magnetostrictive transducer. Rugged and versatile, it is used for cutting, slicing, drilling, grinding, and trepanning regular or irregular shapes.

Substances worked include semiconductors, ceramics, ferrites, carbides, metals, jewels, and other hard or brittle materials.

The ultrasonic driver produces 100 watts and is based on a design thoroughly proved in the field. The transducer carries a full-year guarantee with an additional 18 months warranted on a prorated basis.

The cutting head is mounted on a rugged base, has a foolproof cutting force adjustment, and a built-in force dial. *Write*: Raytheon Mfg. Co., Waltham 54, Mass. *Phone*: Twinbrook 3-5860

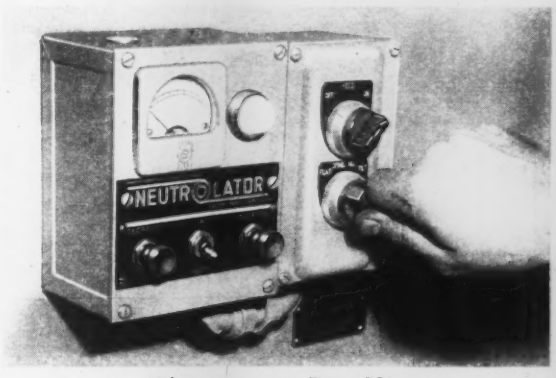
Rotary Surface Grinders Have Rapid Tilting Spindle

A quick-tilting device for creating wheel clearance on vertical spindle rotary surface grinders permits conversion from rough to finish grinding in seconds.

The Quick-Tilt spindle is available as optional equipment on all Mattison No. 24, and 36 vertical rotary surface grinders. (Control is shown.)

On average grinding operations, output can be increased as much as 50 per cent without sacrificing accuracy. Wheel drag, power loss, and heat buildup are no longer problems when grinding large surfaces.

The advantages of both high stock removal and flat grinding can be realized on individual jobs, and there is no need to compromise accuracy to improve stock removal efficiency. *Write*: Mattison Machine Works, Rockford, Ill.



(*Please turn to Page 92*)

production problem

Mass-production of modern "wonder alloys" might, in some respects, be compared with an attempt at assembly-line fabrication of Cellini's famed sculpture of "Perseus".

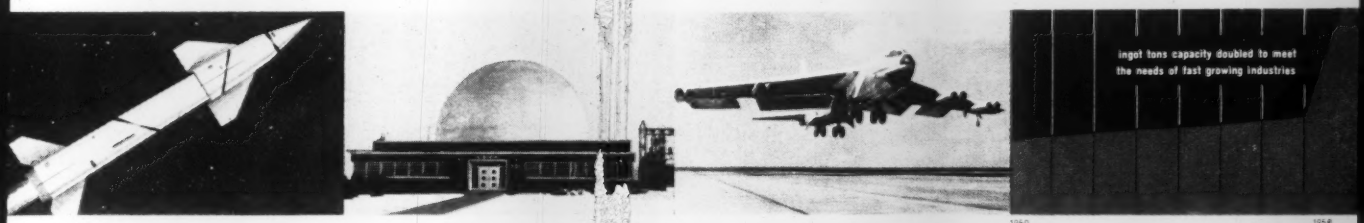
Both would require the careful precision, the intricate craftsmanship of experienced specialists, intimately familiar with ultra-modern production techniques.

Yet within the past year, high volume production of quality specialty steels has become a reality at *Carpenter*. *Ingot tonnage capacity*—the equipment and quality controls required to produce the world's finest steels—has *doubled almost overnight* through the acquisition of steelmaking facilities in Bridgeport, Connecticut.

For many years, demands by American industry for *Carpenter*-quality stainless, tool and alloy steels often exceeded our ability to produce. Like that of all custom-craftsmen, our objective was *quality*, the pioneering of new and better steels, rather than *quantity*.

Today, as the result of long-planned expansion, we can offer *quantity* along with famous *Carpenter quality*. For the first time, with our increased capacity, both quantity and quality are available. And both will continue to be available, even in times of peak demand.

While *quality* will continue to remain a sacred *Carpenter* watchword, we are determined to lead the way and grow apace of the ever-increasing demands of industry for the world's finest specialty steels.



tool and die steels
stainless steels
electronic and magnetic alloys
special-purpose alloy steels
valve, heat-resisting and super alloy steels
tubing and pipe
fine wire specialties

Carpenter Steel

The Carpenter Steel Company
Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

NEW PRODUCTS and equipment

Ride-or-Walk Tractors

These electrically powered industrial tractors can be operated as rider types or "walkie" vehicles.

Offered in six models with 12, 24, or dual 12/24 volt systems, the

Model RT units have speeds ranging from 3 to 6 mph. All operating controls and horn are in the Roto-Cam control handle.

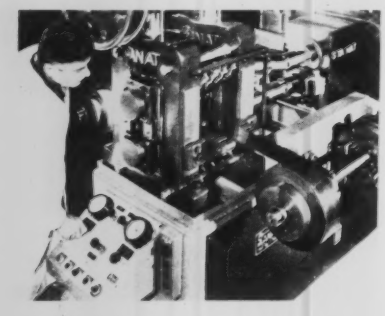
The tractors have three braking systems. *Write*: Dept. R8-23, Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass. *Phone*: Watertown 4-5400

Strip Mill Inexpensive

This low cost, precision reversing strip mill is intended for use principally in specialty order shops and pilot production plants.

Its two-way strip winding mechanism is both a pay-off and recoiler. Powerful air clutches furnish sensitive control of front and back tension.

In tests, the 1½ and 5 x 8 in. mill reduced stainless steel, platinum, gold plate, nickel, and molybdenum strip. *Write*: Stanat Mfg. Co. Inc., 500 Shames Dr., Westbury, N. Y. *Phone*: Edgewood 4-8700



Drives Mounted Vertically

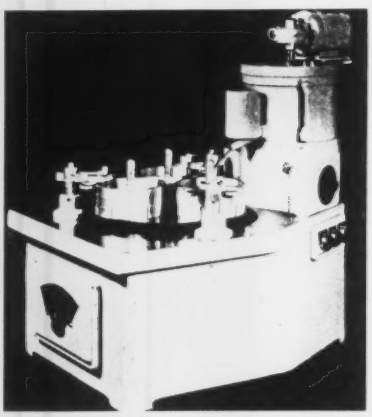
Gearshift drives designed for original equipment manufacturers and many industrial applications are available in a number of gear ratios for vertical mounting (shaft up).

They are used with geared devices or V-belts to drive machines or perform machine operations. *Write*: Dept. 149, Lima Electric Motor Co. Inc., Lima, Ohio.

Compact Unit for Lapping

The compact Gyro-Matic 12-in. flat lapping machine is a bench model that provides the high tolerance output found in larger machines.

Its workholder retainer rings permit a constant rotating movement which provides a truing action to keep the lapping surface completely flat.

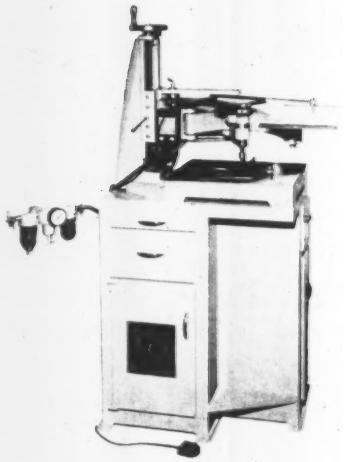


Work is retained and guided for the best lapping action. *Write*: Spitfire Tool & Machine Co., 2931 N. Pulaski Rd., Chicago 41, Ill. *Phone*: Palisade 5-1610

Engraver Is Versatile

Engravers are available with air cylinder attachments for high speed drilling of printed circuits. The Model D-2 provides ratios from 2 to 1 to infinity.

An unskilled operator can drill up to 100 holes a minute. Various



holes can be drilled without tool change as a pantograph arrangement permits guiding the stylus over the master template to whatever diameters are to be reproduced. *Write*: Green Instrument Co., 385 Putnam Ave., Cambridge, Mass. *Phone*: Eliot 4-2989

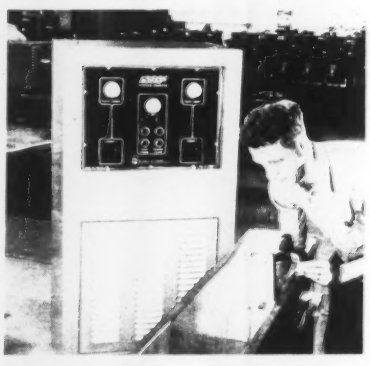
Counter Has Wide Use

New devices for counting also can be used for multiple control and memory functions.

They can be attached to all types of machinery, manufacturing, packaging, and auditing operations. Any measurement translatable into digital units can be handled, including photoelectric, magnetic, and proximity type actuating devices. *Write*: Sterns Control Corp., 220 East Shore Rd., Great Neck, N. Y.

Aids Ultrasonic Cleaning

The Model APT-500 Sonogen generator (3-kw average power output) is designed for high volume production cleaning. It will activate



Positive Protection Against Phase Failure and Phase Reversal ?

Here is your answer!

The Allen-Bradley Bulletin 812 Type F, Type R, and Type RF relays provide positive protection against the hazards to men, motors, and driven machinery, resulting from phase failure and/or phase reversals.

The Bulletin 812 Style F phase failure relay employs a unique static sensing network that responds to all open phase conditions on a motor branch circuit and immediately removes the motor from the line . . . irrespective of the load on the motor (including no load), or the circuit arrangement. This relay even responds to hard-to-detect primary failures on a wye-delta transformer with ungrounded neutral. Furthermore, the five-cycle response prevents nuisance "drop-outs" from transient fluctuations.

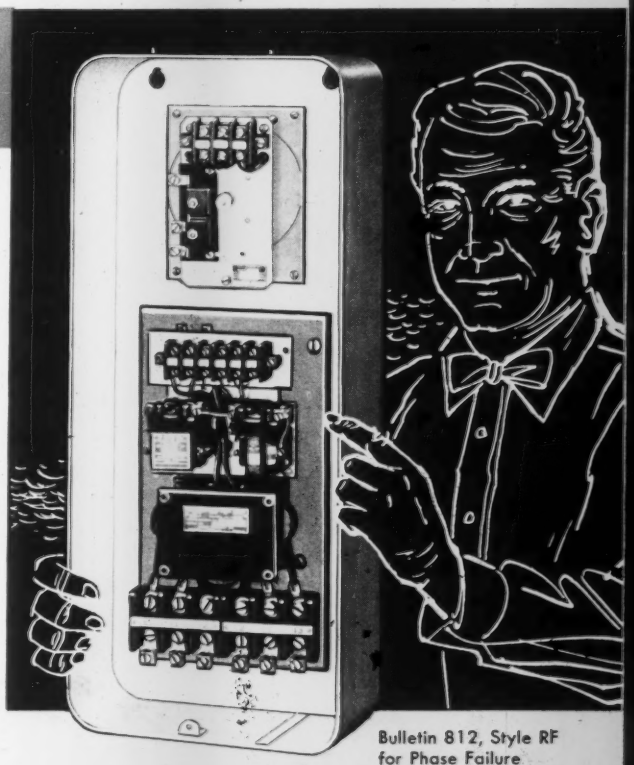
The Bulletin 812 Style R phase reversal relay disconnects the motor from the line—whether it is running or not—when a phase reversal occurs anywhere in the system on the line side of the relay. Thus, it can be employed for a single motor, a group of motors, or an entire power system. In addition, the phase reversal relay prevents the motor from starting should phase failure occur while at a standstill—a vital feature for elevator applications.

The Bulletin 812 Style RF relay combines the elements of Style R and Style F relays for protection against both phase failure and phase reversal. All Bulletin 812 relays are inherently "fail safe." Send for complete information.

Allen-Bradley Co., 1316 S. Second St.
Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd.
Galt, Ont.

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

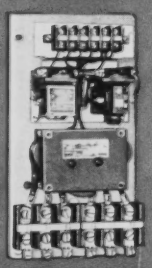
12-58-MR



Bulletin 812, Style RF
for Phase Failure
and Phase Reversal

INDIVIDUAL RELAY UNITS AVAILABLE

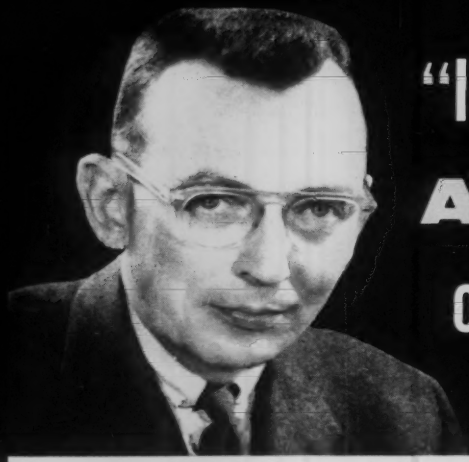
For Phase Failure



Style F covers full load currents from 1.5 to 300 amp in 4 sizes. Coils for up to 600 v, 60 cycles.

For Phase Reversal

Style R made with coils for 110, 208/220, 440, 550 v for either 50 or 60 cycle operation.

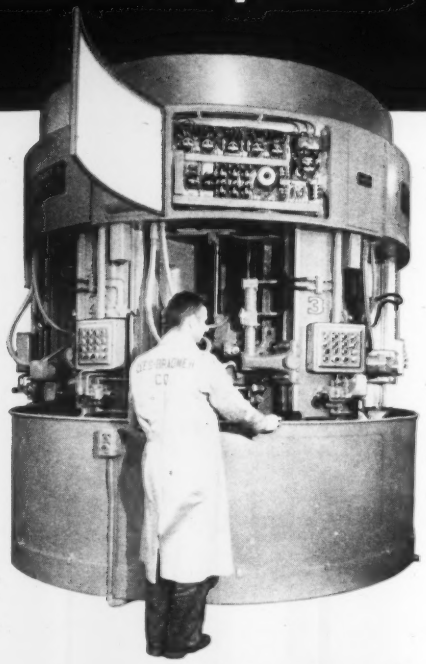


"If we stick to ALLEN-BRADLEY... our control troubles evaporate"

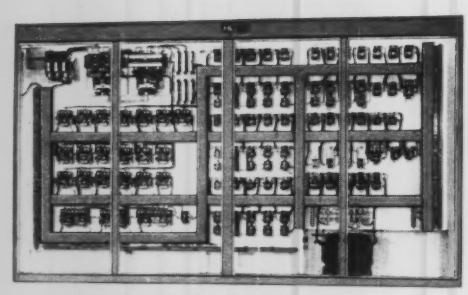
...so says John A. Bradner,
President, Lees-Bradner Co.,
Cleveland, Ohio, machine tool manufacturer.

"Yes, we have chosen Allen-Bradley controls. We use them, like them, and most thoroughly approve of them. We do our level best to see that they're the ones with which LEES-BRADNER machines are equipped.

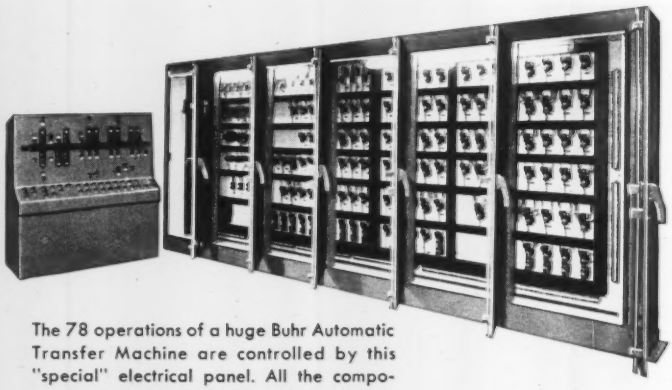
"It has been our experience in over 25 years of pioneering electrical rather than mechanical control of machine tools that, if we stick to Allen-Bradley, control troubles we are too apt to have otherwise—*evaporate!*"



Lees-Bradner Gear Hobbing Machine, above, uses six motor control panels assembled from standard A-B components.



This is the electrical control panel for a 12-station Kingsbury Indexing Automatic which performs 19 operations on an automatic transmission part. All the components in this panel are standard A-B control items.



The 78 operations of a huge Buhr Automatic Transfer Machine are controlled by this "special" electrical panel. All the components are standard Allen-Bradley units.

A-B QUALITY

ALLEN-BRADLEY

MOTOR CONTROL

QUALITY

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis. In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

12-58-R

up to 6 sq ft of transducer area, or 300 gallons of cleaning solution.

The unit features motor tuning, twin oscillator construction, and remote control. Its control panel allows the operator to adjust the entire cleaning procedure without leaving his post. *Write*: Branson Ultrasonic Corp., 40 Brown House Rd., Stamford, Conn. *Phone*: Davis 4-6721

Finishing Speed Upped

The Abrado-Matic TS-31 mechanical finishing machine vertically injects parts to be finished in a rotating mass of abrasive media.

Tests show the method can reduce finishing time on many parts to as low as 10 seconds.

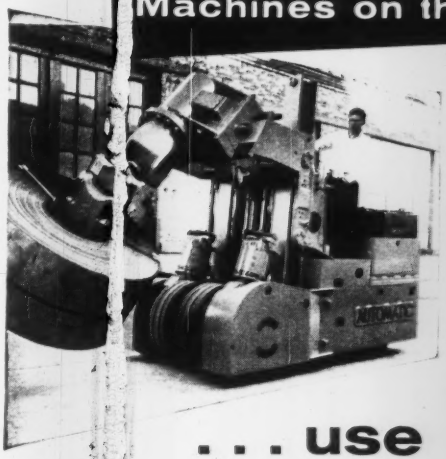
The process may be used on all types of metals and alloys requiring rapid, low cost, surface processing. It produces uniform results. *Write*: Abrado Finish Corp., Grand Rapids, Mich.

System Prevents Repeats

The Andrus-Coon system features dual interlocked (but independent) pneumatic-electrical-mechanical circuits, intended to make accidental repeat operation on single cycling machines impossible.

The system is suitable for a press, brake, shear, indexing unit, or like equipment employing an air-operated friction clutch and spring-set brake. *Write*: Textrol Inc., 4015 Prospect Ave., Cleveland 15, Ohio. *Phone*: Henderson 2-2161

Machines on the move . . . . .



. . . use

FAIRFIELD GEARS!

POWER to operate these machines and countless others that you may see every day, travels *smoothly, efficiently, dependably* through FAIRFIELD GEARS. By specializing exclusively in "Fine Gears Made to Order", Fairfield has become one of America's largest independent producers of these parts.

If you use gears in the product you make, we believe it will pay you, as it has others, to become acquainted with FAIRFIELD—the place where fine gears are produced to meet your specifications EFFICIENTLY, ECONOMICALLY! Fairfield's production facilities are unexcelled. *Call or Write.*

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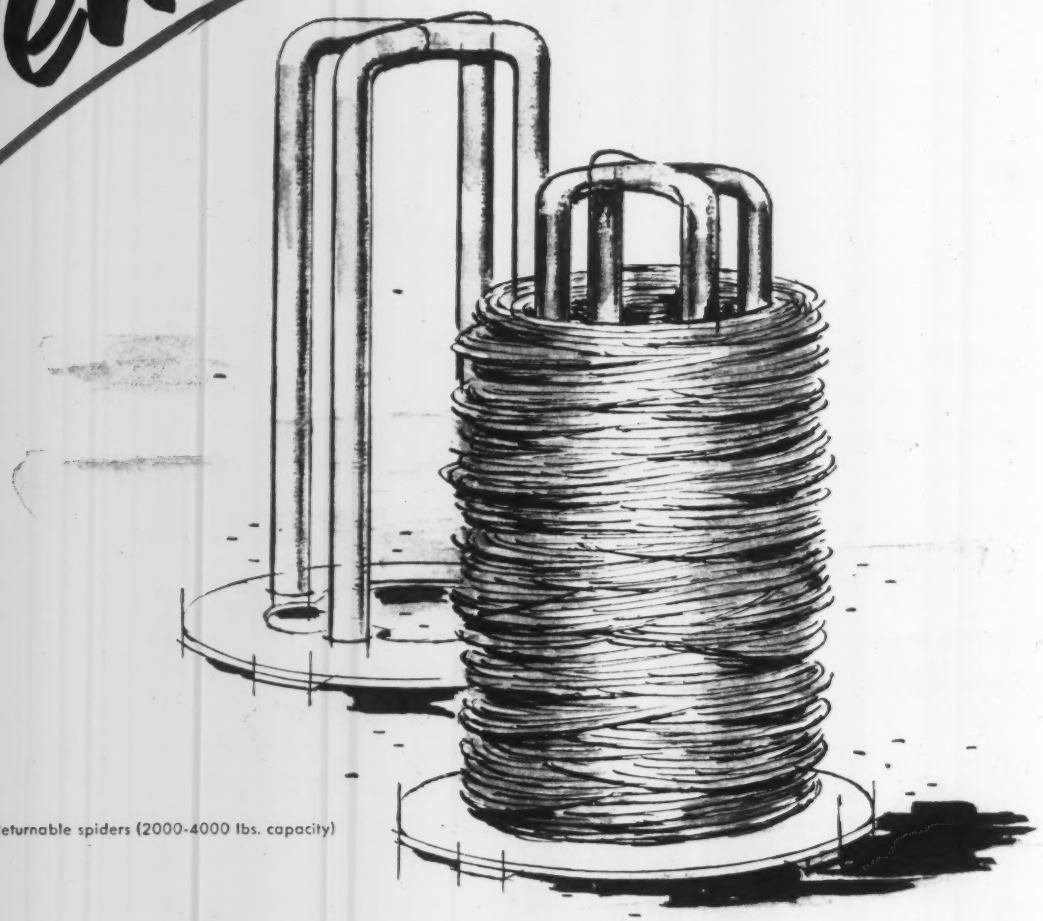
A "PLUS VALUE" IN ANY PRODUCT

Gears and Differentials for FINE GEARS Made to Order for:

TRACTORS • HEAVY DUTY TRUCKS • AGRICULTURAL MACHINERY • POWER SHOVELS AND CRANES
MINING MACHINES • ROAD GRADERS • BUSES • STREET SWEEPERS • INDUSTRIAL LIFT TRUCKS

New 3000-4000 lb.



Returnable spiders (2000-4000 lbs. capacity)

Here is a partial list of the many types of carbon steel wire manufactured by CF&I:

Grades

low carbon
- annealed
- flat and shaped

medium high carbon

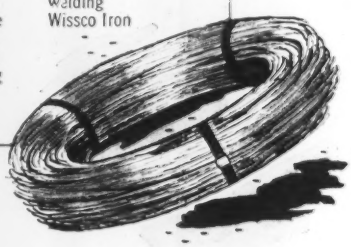
high carbon
- flat and shaped
- oil tempered
- spheroidized

Finishes

- bright dry drawn or lime bright
- bright grease drawn
- cadmium coated
- coppered
- extra clean
- smooth bright
- galvanized
- liquor
- white liquor

Standard Types (partial list)

- aircraft cord
- bee
- bobbin ring
- bobby pin
- bookbinder
- broom
- brush
- casing
- clip
- concrete reinforcing tie
- cotter pin
- curtain spring
- die spring
- fine & weaving
- fuse
- Gamma spring
- garment hanger
- glass netting
- hair pin
- hat
- hose, reinforcement
- hose, mechanical
- hose, vacuum
- lock spring
- lockwasher
- manufacturers' drawn
- mattress
- merchant
- nail
- oil tempered
- picker tooth
- picture cord
- pin ticket
- regulator
- rope
- safety pin
- screen
- shaft, flexible
- Signal Corps
- snake fishing
- spiral binding
- spring
- square
- stapling
- staple
- stone
- tie
- twisted & laid
- upholstery
- valve spring
- weaving
- welding
- Wissco Iron



Steel strapped coils (200-2000 lbs.)

WHEN YOU NEED WIRE . . . MAKE

CONTINUOUS WIRE "SPIDER"
. . . cuts downtime as much as 15%
. . . reduces scrap loss

Here's what CF&I's new giant package did for one upholstery spring manufacturer who had been using 700-lb. wire coils:

- **Downtime was reduced**
- **Production was increased 15% per shift**
- **Men and materials handling equipment were freed for other work**
- **Scrap losses were reduced**

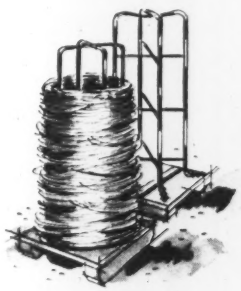
These returnable spiders will cut your production costs, too. If your manufacturing process is not equipped to use spiders, order our 200-2000 lb. continuous-length, steel-strapped wire coils. (Sizes #13 AWG and coarser apply for both spiders and coils.)

From spools to spiders . . . CF&I's newly modernized and enlarged plants are equipped to provide fast delivery on high or low carbon steel wire . . . round, flat or shaped . . . in a wide variety of sizes, tempers, grades and finishes . . . in small quantities or carload lots. Let us know your requirements.

CF&I-WICKWIRE WIRE
THE COLORADO FUEL AND IRON CORPORATION

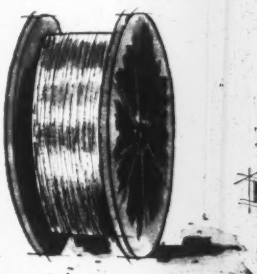
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Oklahoma City • Phoenix • Pueblo • Salt Lake City • Wichita
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • San Leandro • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York Philadelphia • **CF&I OFFICES IN CANADA:** Montreal • Toronto • **CANADIAN REPRESENTATIVES AT:** Calgary Edmonton • Vancouver • Winnipeg

Other CF&I standard packaging methods

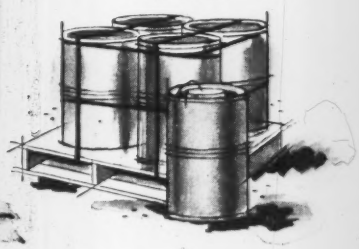


Non-returnable spiders (500-700 lbs. capacity)

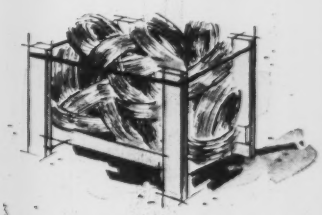
Reels (500-800 lbs. capacity)



Pay-off paks



Steel strapped wooden rack



5758

CF&I YOUR SOURCE OF SUPPLY

BEFORE...
Separate Bolts, Nuts and Washers complicate inventories, increase assembly costs.
AFTER...
Washers as integral parts of bolts and nuts eliminate problems, speed assembly at lower cost.

save money

by simplifying fastener design

Here is a simple application of a basic bolt making principle which affects substantial savings.

These savings, resulting from simplified design, are realized in every step of the operation from lower first cost of the fasteners through inventory to final assembly. Totalled, they are well worth while.

There are many other basic principles . . . often overlooked in designing and specifying fasteners, which are of importance cost-wise.

You'll find them in our new booklet, "How to specify fasteners . . . and save". Filled with drawings and charts, it makes a handy guide in designing or buying any headed parts. If you can use a copy, write to North Tonawanda or ask a Field Representative.

BUFFALO BOLT COMPANY

Division of Buffalo-Eclipse Corporation

N. Tonawanda, N. Y., Princeton, Ill.

MAKING BOTH FASTENERS AND FRIENDS FOR 100 YEARS

• *3 convenient service centers*

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EASTERN OFFICE
New York City, REctor 2-1888

CENTRAL OFFICE
North Tonawanda, JAckson 2400
(Buffalo)

NEW literature

Write directly to the company for a copy

Slitting Equipment

Equipment for coil and sheet stock slitting is described in Bulletin 44-A. Included are recommended slitting procedures and suggestions on coil handling, width of cut, and use of entry and delivery pinch rolls. E. W. Bliss Co., 1375 Raff Rd. S. W., Canton 10, Ohio.

Switchgear

Detailed information on the operation, characteristics, and application of indoor and outdoor Metal-clad switchgear is covered in Bulletin GEA-5664E. The units are rated at 2.4 to 13.8 kv with interrupting capacities of 75 to 1000 mva. General Electric Co., Schenectady 5, N. Y.

Heavy Duty Strapping

A pocket size catalog, SSS-200, contains all the product information on standard and heavy duty Stanley steel strapping. Hand and power tools, accessories, Colorgraph strapping, and lithographed seals are covered. Stanley Steel-Strapping Div., Stanley Works, New Britain, Conn.

Pierce-Nut Units

Specifications for press-actuated Type CD and BL units for short, medium, and long run nut-insertions are covered in a catalog. Flat and embossing dies, and sizes and threads of available Fabristeel Multipierce Nuts are included. Wales-Strippit Inc., 210 S. Buell Rd., Akron, N. Y.

Industrial Tractor

An electronic industrial tractor that requires no operator is described in Bulletin 586. The Guide-O-Matic tractor is controlled by a wire guidance system or a recently developed optical guidance device. Barret-Cravens Co., 628 Dundee Rd., Northbrook, Ill.

Electric Motors

Super-Seal open-type motors suitable for many applications previously requiring enclosed designs are described in Bulletin 03-51B9040. These motors are unaffected by moisture, dust, dirt, oils, acids, or alkalies. Industries Group, Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Air Vises

A brochure describes air vises for automatic, self-centering operations within a tolerance of 0.001 in. with holding power up to 4000 lb at 100 psi. Heinrich Tools Inc., Racine, Wis.

Rectifier Power Units

Descriptions, data, and specifications for standard three-phase units and special low voltage units are in this 10-page catalog. Both have capacities from ¾ to 500 kw. Syntron Co., 370 Lexington Ave., Homer City, Pa.

Carbide Gun-Drills

Starbore carbide gun-drills for high speed production of precision holes from the solid are described in Catalog SC-110. They combine the features of an oil-flute drill and a trepanning tool. Star Cutter Co., P. O. Box 376, 34500 Grand River Ave., Farmington, Mich.

Permanent Molds

Bulletin 23 describes the use of Meehanite permanent molds in the production of metals and other materials. Meehanite Metal Corp., 714 North Ave., New Rochelle, N. Y.

Generator Set

Highlights of design, engineering, and construction of the G-226 portable, lightweight generator set are covered in Catalog BU-412. Engine-Material Handling Div., Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Air-Moving Units

Special purpose air-moving units for original equipment manufacturers are described in Bulletin 3412. Covered are packaged centrifugal blowers; vaneaxial, tubeaxial, and propeller fans; pressure blowers; and fluid coolers. American Blower Div., American-Standard, Detroit 32, Mich.

Protected Motors

Motors designed for outdoor operation under extreme weather conditions in ratings from 250 to 2000 hp are covered in Bulletin No. 2550. Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis.

Coating Machine

The Convert-O-Matic fully automatic, straight line, conversion coating machine is covered in a bulletin. It handles blackening, phosphating, bright dipping, precleaning, and pickling operations. Hanson-Van Winkle-Munning Co., Church Street, Matawan, N. J.

Honing

A 16-page case history booklet on honing jobs gives production rates and data on size, tolerance, stock removal, and finish on 90 diversified parts from $\frac{1}{8}$ to $2\frac{3}{4}$ in. ID. Sunnen Products Co., 7910 Manchester Ave., St. Louis 17, Mo.

Steel Castings

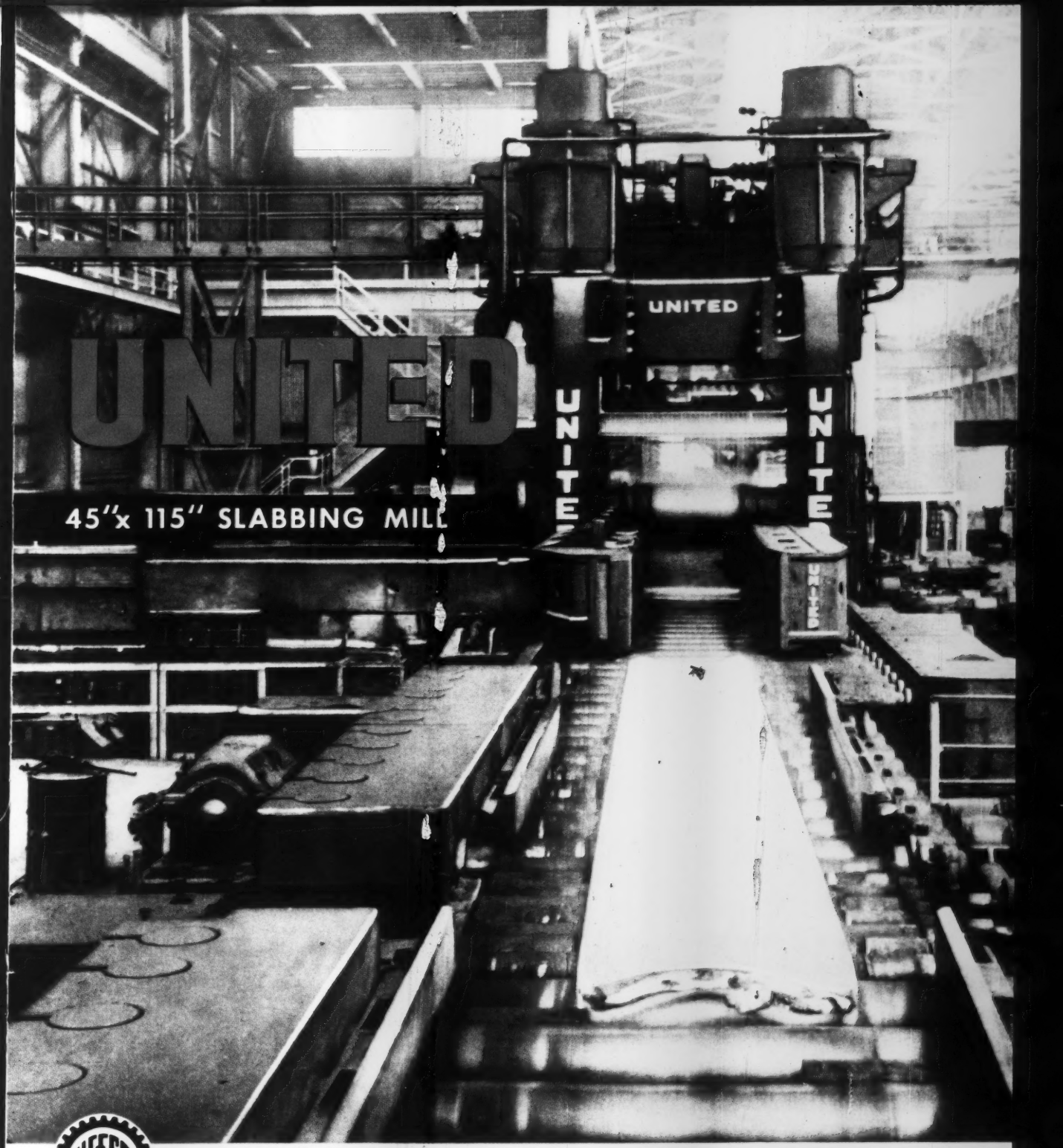
A folder describes electric furnace alloy and carbon steel castings. Standard and special steel castings are covered. Farrell-Cheek Steel Co., Sandusky, Ohio.

Drilling Machine

Specifications on the high speed H sensitive drilling machine are presented in Bulletin No. 160 R. The unit is designed to save space, labor, and material in making small components. Edlund Machinery Co., 44 Huntington St., Cortland, N. Y.

Drill Jig Bushings

Precision drill jig bushings are described in Catalog 582. Standard Bushing Manufacturers Inc., 1533 Elmwood Ave., Providence 7, R. I.



UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington.

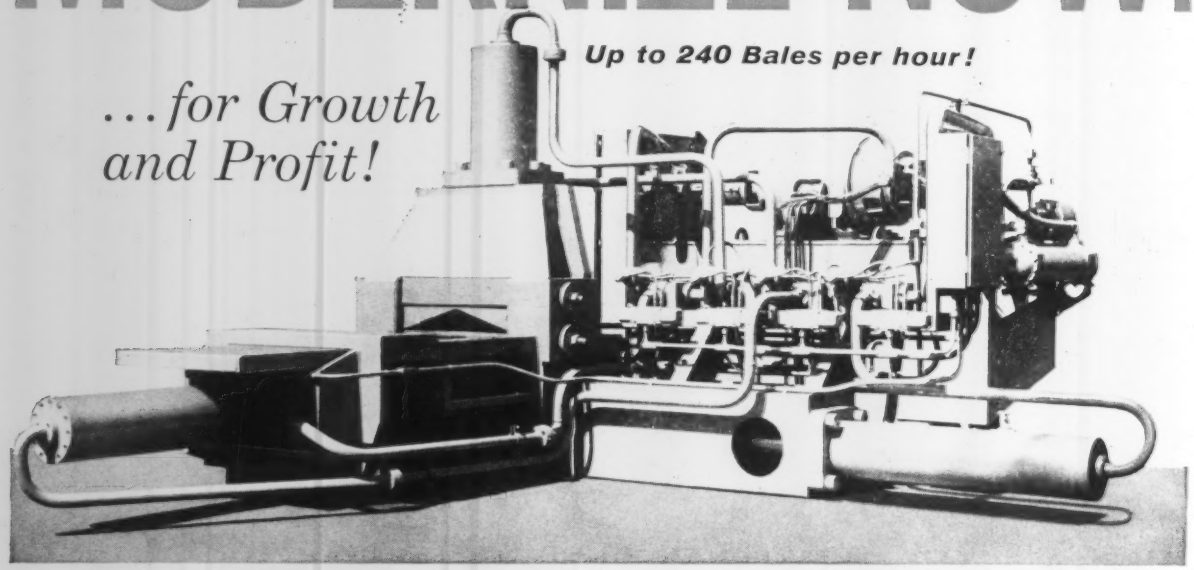
SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

MODERNIZE NOW!

...for Growth and Profit!

Up to 240 Bales per hour!



The HARRIS TG-50 Series

for high-speed production of small bales

These fully automatic 3-compression Harris presses are suitable for baling both ferrous and non-ferrous metals. They are especially designed to handle sheet clippings, stamping skeletons, wire and cans.

No special foundation is required for these small, compact presses and they may be moved from one location to another. The whole operation is by pushbutton. All necessary starters, control panel, and pushbutton panel are included.

Talk with a Man from Harris

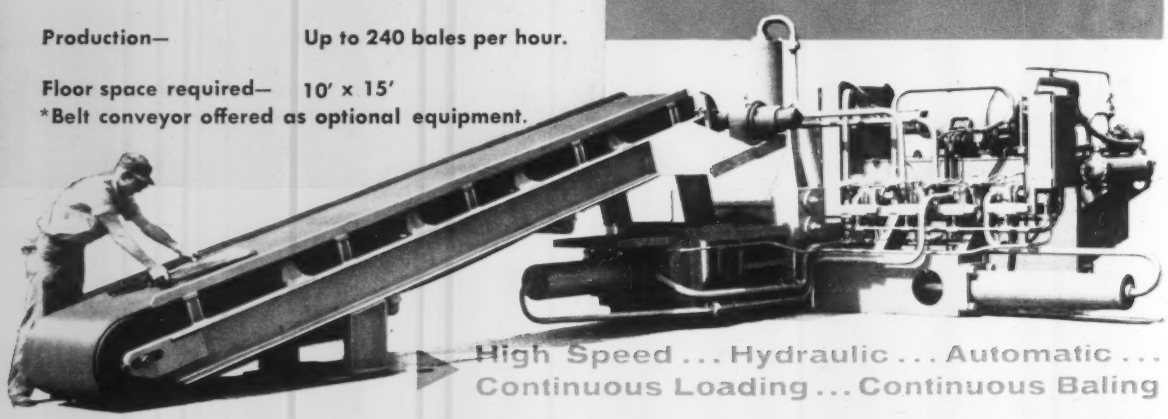
Your choice of bale size—	**4" x 4" x variable, up to 10" x 10" x variable, inclusive.**
Bale weights—steel clips	**4" x 4" x 15"—25 lbs. 10" x 10" x 15"—120 lbs.**
Production—	**Up to 240 bales per hour.**
Floor space required—	**10' x 15'**

***Belt conveyor offered as optional equipment.**

HARRIS FOUNDRY & MACHINE CO.

Hydraulic Engineers Since 1889

CORDELE, GEORGIA



High Speed ... Hydraulic ... Automatic ...
Continuous Loading ... Continuous Baling

Mills Stretch Delivery Promises

STEELMAKERS are extending delivery promises as major consumers come into the market for big tonnages. Two months ago, they were quoting four weeks' delivery on cold-rolled sheets. One month ago, minimum leadtime was five weeks. Today, it's six or seven.

Galvanized products are in such tight supply that some mills have quotas for their sales offices. Many producers are booked well into February, and some are sold out through the first quarter of 1959.

In Chicago, consumers are being told that they must keep their orders in line with recent requirements.

Mill executives describe current sheet bookings as a "comfortable backlog" but admit they may be losing orders to competitors who occasionally have overruns in certain grades.

AUTO OUTPUT AT '58 PEAK—Auto production, still the mainstay of the steel market, last week reached its highest level of 1958. Automakers turned out about 148,000 cars—almost as many as in 1957's corresponding week, when strikes weren't such a problem. Steel suppliers are getting a steady flow of orders from car manufacturers but nothing to suggest that buyers are expanding inventories now. Automakers plan a gradual buildup to reach at least 30 days' supply of all products, but it won't start until late in the first quarter of '59. It will probably continue through the second quarter.

APPLIANCES WARM UP—Although they're less conspicuous than autos, appliances are playing a major role in the steel market's recovery. Factory sales of laundry units in October were the highest in two years, exceeded only in October, 1956 (gas dryers and washer-dryers set all-time records). Sales of gas ranges also hit a two-year high last month, while shipments of gas fired automatic water heaters were the best since early 1956. Flushed with sudden prosperity, appliance makers are giving steelmen an early Christmas gift: Bigger orders for cold-rolled and silicon strip.

TUBULAR PRODUCTS SLOW—Demand for seamless and buttweld standard pipe is ebbing with the seasonal decline in construction activity. Line pipe business is also deteriorating, and producers see little likelihood of an upturn before January. Says an industry leader: "If the Supreme Court reversed the Memphis decision today, there'd be no great influx of orders tomorrow, but the gas transmission companies could at least do some planning. We look for better shipments in 1959, with a bulge at midyear." Demand for oil country goods is improving slowly as drillers liquidate their inventories.

FORECAST FOR '59—Bethlehem Steel Co. expects next year's steel production to be 110 million ingot tons, with operations averaging 76 per cent of capacity. Says David C. Roscoe, assistant general manager of sales: "Use of steel by the automotive, railroad, mining, quarrying, and lumbering industries will probably increase by more than 20 per cent. Construction and consumer durable goods industries will take 5 to 20 per cent more steel than they did in 1958. Among civilian users, shipbuilders and aircraft manufacturers will take the same tonnage or 5 per cent less."

PRODUCTION SLIPS—Last week, steelmaking operations slipped 1 point to 74 per cent of capacity. Production was about 1,997,000 net tons of steel for ingots and castings. November's output hit 8.6 million ingot tons—200,000 less than the industry produced in October. Total for 11 months: 76.5 million. If December's output matches November's, 1958 production will be 85 million tons.

WHERE TO FIND MARKETS & PRICES

	News	Prices
Aluminized Sheet	108	...
Bars, Merchant	105	112
Reinforcing	108	113
Boiler Tubes	...	115
Clad Steel	...	116
Coke	...	120
Coal Chemicals	...	120
Charts:		
Finished Steel	...	111
Ingot Rate	110	...
Scrap Prices	...	125
Comparisons	...	111
Electrodes	...	120
Fasteners	...	115
Ferroalloys	...	121
Fluorspar	...	120
Footnotes	...	115
Imported Steel	110	120
Ingot Rates	110	...
Metal Powder	...	120
Nonferrous Met.	128	130
Ores	...	120
Pig Iron	110	119
Piling	...	112
Plates	108	112
Plating Material	...	131
Prestressed Strand	...	*
Price Indexes	...	111
Producers' Key	113	...
R.R. Materials	122	115
Refractories	...	120
Scrap	125	126
Semifinished	...	112
Service Centers	132	119
Sheets	109	113
Silicon Steel	...	114
Stainless Steel	110	116
Strip	109	114
Structurals	132	112
Tin Mill Prod.	122	114
Tool Steel	...	116
Tubular Goods	110	116
Wire	122	114

*Current prices were published in the Nov. 24 issue and will appear in subsequent issues.

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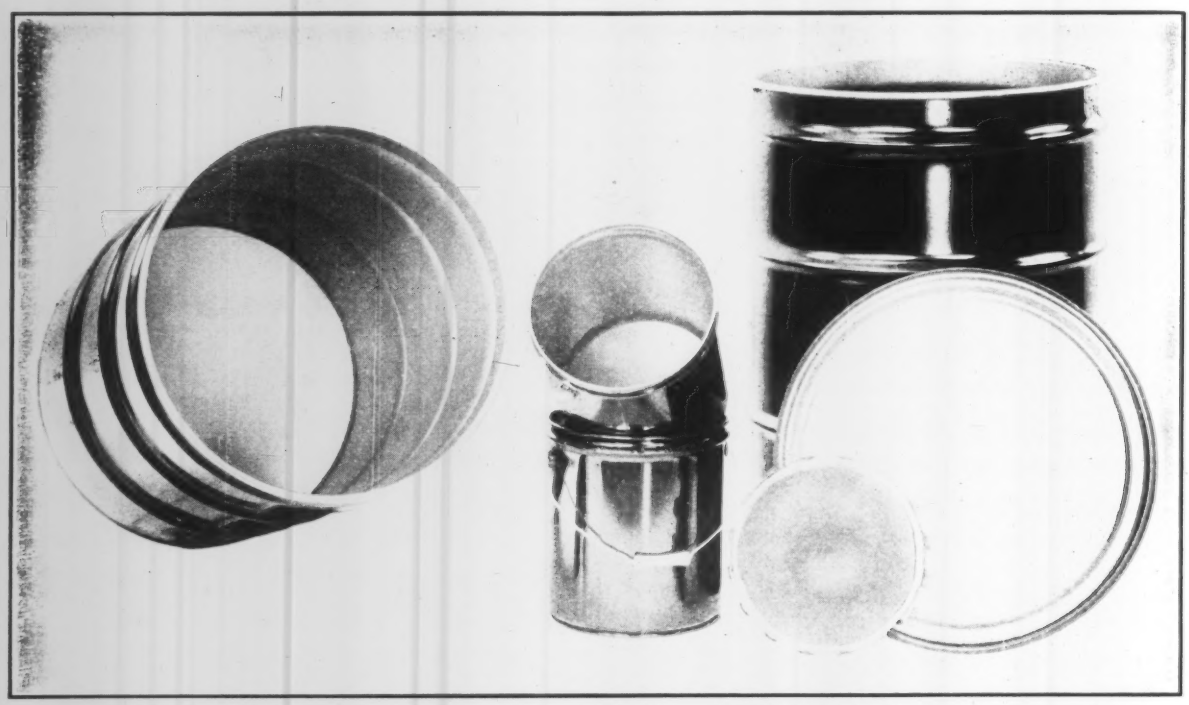

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Europe: Aluminium-Schweisswerk A. G.
Schlieren-Zurich, Switzerland

WHO'S WHO IN VACUUM MELTING

COMPANY	VACUUM INDUCTION PROCESS Place	Annual Cap. (lb)	VACUUM ARC PROCESS Consumable Electrode Place	Annual Cap. (lb)
Allegheny Ludlum Steel Corp.	Watervliet, N.Y.	3,000,000	Watervliet N. Y.	24,000,000
Allvac Metals Co.	Monroe, N.C.	1,000,000		
Beryllium Corp.	Hazleton, Pa.	150,000[1]		
Brush Beryllium Co.	Elmore, Ohio	275,000		
Cannon-Muskegon Corp.	Muskegon, Mich.	450,000		
Carborundum Metals Co., Div. of Carborundum Co.			Akron, N.Y.	1,000,000
Carpenter Steel Co.	Reading, a.	600,000	Reading, Pa.	8,000,000
Climax Molybdenum Co., Div. of American Metal Climax Inc.			Coldwater, Mich. Detroit	1,000,000[2]
Crucible Steel Co. of America	Syracuse, N.Y.	4,500,000	Syracuse, N.Y.	20,000,000[3]
Wilbur B. Driver Co.	Newark, N.J.	4,000,000		
Driver-Harris Co.	Harrison, N.J.	(4)		
Electro Metallurgical Co., Div. of Union Carbide Corp.	Niagara Falls, N.Y.	(5)	Niagara Falls, N.Y.	(5)
Firth Sterling Co.			Trafford, Pa.	1,200,000[14]
Haynes Stellite Co., Div. of Union Carbide Corp.	Kokomo, Ind.	3,600,000		
Johnston & Funk Metallurgical Corp.			Wooster, Ohio	2,400,000
Kolcast Industries Div., Thompson Ramo Wooldridge Inc.	Minerva, Ohio	5,566,000[6]		
Latrobe Steel Co.	Latrobe, Pa.	1,000,000	Latrobe, Pa.	4,500,000
Mallory Sharon Metals Corp.			Niles, Ohio	(7)
Metallurgical Products Dept. General Electric Co.	Detroit	1,000,000[8]		
Metals Div. Kelsey-Hayes Co.	Utica, N.Y.	12,000,000		
Microcast Div. Austenal Inc.	Dover, N.J.	900,000[9]		
Midvale-Heppenstall Co.			Philadelphia	16,000,000
Oregon Metallurgical Corp.			Albany, Oreg.	1,200,000
Republic Steel Corp.			Canton, Ohio	48,000,000[10]
Sierra Metals Corp., Subsidiary of American-Marietta Co.	Wheeling, Ill.	750,000[11]		
Timken Roller Bearing Co.			Canton, Ohio	5,000,000
Titanium Metals Corp. of America			Henderson, Nev.	22,000,000
Universal-Cyclops Steel Corp.	Bridgeville, Pa.	2,500,000	Bridgeville, Pa.	20,000,000[12]
Vanadium-Alloys Steel Co.	Latrobe, Pa.	Not available	Latrobe, Pa.	8,400,000
Westinghouse Electric Corp.	Blairsville, Pa.	1,250,000	Blairsville, Pa.	3,000,000[13]

(1) Currently for Atomic Energy Commission use. Will offer products for commercial sale when conditions permit.
(2) Furnaces used for research and commercial production.
(3) Would be reduced some if titanium demand increases significantly.
(4) Uses 600 lb furnace for research and commercial production.
(5) Facilities include six, 300 lb, vacuum induction furnaces; four, 300 lb, consumable electrode vacuum furnaces, and five, 10 lb, nonconsumable electrode vacuum furnaces for research, AEC, and commercial production.
(6) Does not include a 50 lb experimental furnace or a 350 lb induction vacuum unit for the pouring of castings.
(7) Company will make vacuum melted alloys in titanium and zirconium furnaces having annual capacity of 14 million to 18 million lb.
(8) Does not include an experimental furnace at Cincinnati with annual capacity of 1.5 million lb.
(9) Furnaces used for research and commercial production.
(10) Capacity for making vacuum melted alloys will vary, depending on demand for titanium.
(11) Producing classified material, but hopes to offer for commercial sale in near future.
(12) Includes 8 million lb of capacity being installed for operation later this year or early 1959.
(13) Capacity for single melting. Capacity for double melting is 1.5 million lb.
(14) Furnace with 2.4 million lb of capacity is being installed.

Vacuum Melting Gains

New producers and continuing research bring developments in ingot size, new alloys, supply, price, quality, furnace design, and uses which may benefit you

IF IT'S been six months or more since you last considered using vacuum melted metals, it's time for another look. And if you don't find what you want today, mark your calendar to look again six months from now.

Consider just a few of the changes which have come about within the last year or two. They may help you save money or improve your product.

• No. 1, Ingot Size—Last year, the biggest ingot that could be produced by the vacuum induction process was 3000 lb. Today, it's 5000 lb. For the vacuum consumable electrode process, the maximum in 1957 was 12,000 lb. Soon, a 40 in. diameter, 40,000 lb ingot will be available. Lectromelt Furnace Div. of McGraw-Edison Co., Pittsburgh, is engineering a furnace that will handle that size.

• No. 2, New Alloys—Producers are uncovering new alloys almost faster than they can name them. And old air melted alloys are being vacuum

melted with results which give them a new set of physicals. In STEEL's 1956 Metal Selector, only 53 vacuum melted metals and alloys were listed. In the 1958 edition (insert, Oct. 20 issue), there were 116.

• **No. 3, Supply**—In 1957, supply was a problem confronting potential users of these metals. The 1956 Metal Selector listed only eight sources. In July, 1957, STEEL listed 20 commercial producers, some of whom were basically titanium or zirconium producers using excess furnace capacity to turn out other vacuum melted metals. Thirty producers are listed on Page 103. With the slump in demand for titanium, more capacity is being made available for other metals.

In addition to the Page 103 list, several companies, such as Hoskins Mfg. Co., Detroit, and International Nickel Co. Inc., New York, and Vanadium Corp. of America, Cambridge, Ohio, have small research furnaces. Inco produces a small amount of nickel alloy for sale. Also, some investment casting producers, such as Misco Precision Casting Co., Whitehall, Mich., have units for vacuum melting and casting of high-purity metals. Occasionally, they use the melting stage for making commercial alloys.

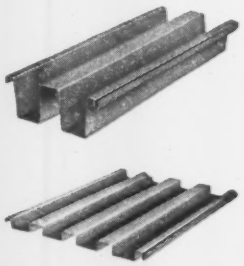
It is difficult to peg the exact capacity of the industry, but W. W. Dyrkacz, manager of quality control for Allegheny Ludlum Steel Corp. at Watervliet, N. Y., estimates that annual induction melting capacity will be 27 million lb by the end of this year, and consumable electrode capacity will be 100 million lb.

• **No. 4, Price**—One of the biggest drawbacks has been price, and it is still a problem. But most respondents to STEEL's survey indicate that price has been lowered between 10 and 15 per cent on the average over the last year. They feel that further reductions will be possible as production efficiency and output increase. The big price disadvantage is for the simple alloys, which may cost five or six times as much as similar air melted alloys. But with more complex compositions, producers say vacuum melted metals may even be cheaper than air melted counterparts.

Initial cost is not always the most important factor, producers claim. Increased yield, higher quality, and better workability often offset the higher cost. P. J. Wooding, manager of engineering services, Vacuum Furnace Dept., Lectromelt Furnace Div., McGraw-Edison says: "It can frequently be shown that reduction in rejects of parts already carrying machining costs will justify the premium involved." And many times it's simply a matter of the vacuum melted metal being able to do what an air melted metal can't.

• **No. 5, Quality**—Purity and quality are inherent in vacuum melted metals, but for some applications even better characteristics are required. With induction furnaces, there is the danger of crucible contamination, although this process generally produces the cleanest metal. With consumable arc furnaces, the quality of the product is limited somewhat by the quality of the air melted electrode. Several companies are working on a combination of the two processes—using an induction melted electrode in the arc

Steel Roof Decks and Flooring cold rolled up to 200 f.p.m. on this mammoth



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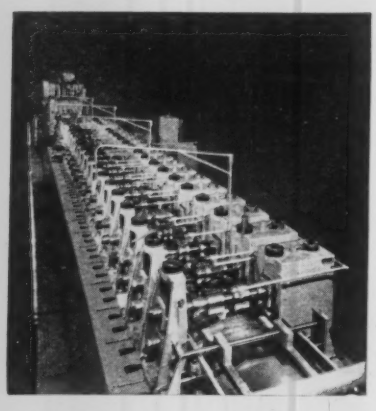

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melting furnace. Costs are naturally higher, but for certain applications, that can be justified.

• **No. 6, Furnace Design**—Furnace design and installation improvements are extending the markets for these metals, too. Most producers feel that 5000-lb ingots are the maximum for induction melted metals. But Mr. Wooding says that vacuum arc furnace size "is limited only by engineering problems and the availability of capital for experimentation. If an 80 in. diameter ingot can be produced in a vacuum arc furnace, many of the turbine rotors presently being stream degassed will be purchased as vacuum arc melted ingots."

Mr. Wooding reports that power supply problems for vacuum arc furnaces are being overcome with the development of a new power supply. "A single package unit can now be built, using water-cooled silicon diodes to suit any given size of furnace. This development has produced the following savings: Power supply cost reduction of 25 per cent; space requirement reduction of 40 per cent; increase in efficiency of 10 to 15 per cent; improvement in power factor of 10 to 15 per cent." Such developments eventually might effect further reduction in the price of these metals.

• **No. 7, New Uses**—The logical result of these advances is the extension of the markets for vacuum melted metals. As little as two years ago, aircraftmakers took the lion's share of the alloys and superalloys produced in a vacuum, especially for jet engines. While they still are considered by many producers as the greatest potential users, others have climbed onto the bandwagon.

Electronics partmakers are finding new applications. Radio Corp. of America is developing uses for high-purity metals in tube parts. Missiles are a natural for superalloys and other metals made in a vacuum. Several producers think the bearing field has great potential, and many are counting on turbines to up their sales. The Atomic Energy Commission has been a big customer, and many producers feel that civilian application of nuclear power will boost sales in the not too distant future.

Other potential markets mentioned are machinery, tool steels, airframes, honeycomb structures. In fact, one industry official says that wherever precision parts, extensive machining, or extremely high quality are involved, vacuum melted metals will find economical use.

Steel Bars . . .

Bar Prices, Page 112

While demand for merchant steel bars continues to edge upward, most buyers are ordering cautiously. They appear to be holding back orders until the last minute. Rolling cycles are being watched closely.

Distributors, cold drawers, and fastener manufacturers are specifying a little more actively. In general, two to four weeks is the range on deliveries on hot-rolled bars. New business in cold finished is coming in at a much better rate than it was a couple months ago.

A full line of 4-D wrought iron bars, rounds, and angles will be available from A. M. Byers Co., Pittsburgh, beginning Dec. 15. Bars

(*Please turn to Page* 108)

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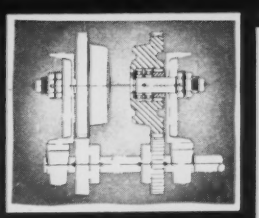

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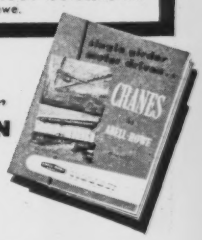

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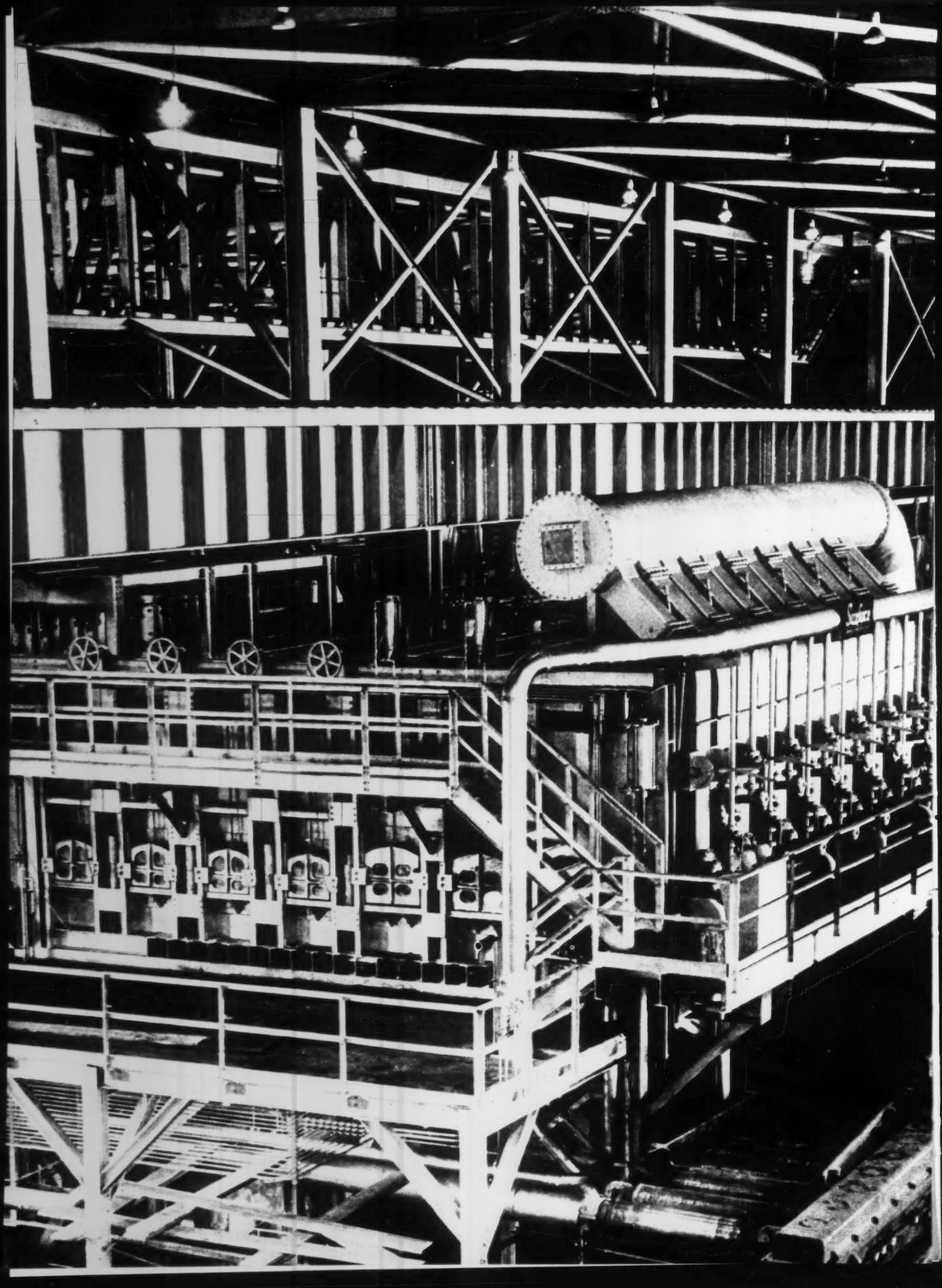

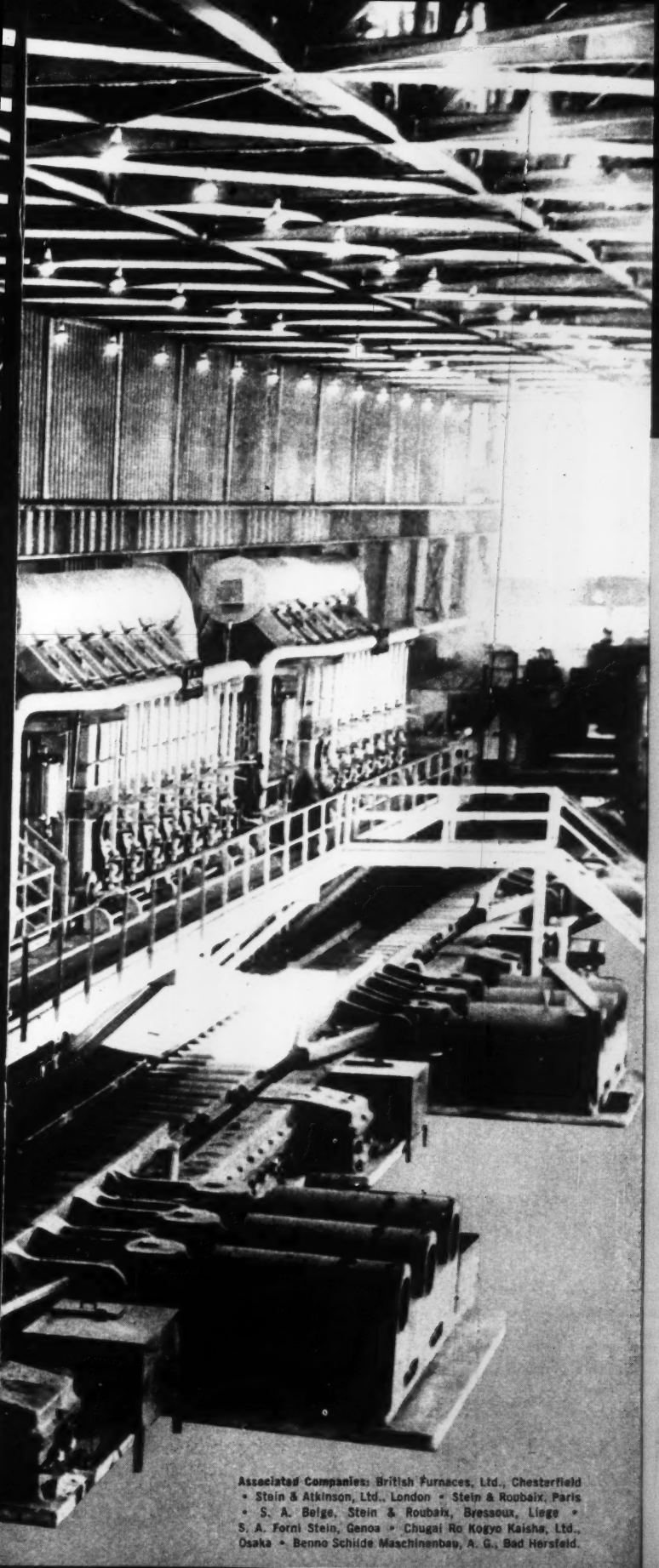

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(*Concluded from Page 105*)
will be available in lengths up to 30 ft. The company has always manufactured iron bars and shapes in limited sizes.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 112

Foreign bars are competing increasingly with the domestic product at many points. On the West Coast, imported bars are reported selling at $5.50 per 100 pounds, or about $1 a hundred under domestic producers' mill quotations.

Some slackening in bar needs is expected as the seasonal decline in highway building and other construction gets underway. Favorable weather in many areas of the country has enabled contractors to get in a lot of extra time. Substantial ordering for highway construction is expected over the winter months as plans are pushed for spring programs.

Seasonal letdown in construction activities is being reflected in demand for other items. Plenty of orders are still being booked, but delivery releases are dwindling with contractors pouring less concrete for roads and bridges.

STAINLESS COSTS LESS THAN ALUMINUM—

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Republic Steel Entering Aluminized Sheet Market

Republic Steel Corp., Cleveland, is entering the aluminized sheet market. It will supply the product in coils from its Warren, Ohio, Works. First production may come out this month.

A large part of the market for aluminized sheets is in auto mufflers; a still broader application is seen as prices on the product are made more competitive with other steel products, such as galvanized sheets.

Armco Steel Corp., Middletown, Ohio, has been the sole producer of aluminized until recently. U. S. Steel was scheduled to begin production of cut lengths at its Gary Works beginning this quarter, and coils at its Irvin Works in the second quarter, 1959. Armco has been supplying coils, the product auto people are reported to be clamoring for.

Since aluminized sheets cost one-fourth to one-third more than galvanized sheets, there may not be many additional uses in automobiles other than mufflers until prices are reduced. Aluminized stock is reported booked up well into first quarter.

Plates . . .

Plate Prices, Page 112

Heavy and wide plates are in stronger demand. They are getting a mild lift from a pickup in new freight carbuilding and repair programs—further activity is anticipated next year. In general, plate orders are spotty, and are expected to continue so the rest of this year.

The Atomic Energy Commission has awarded a $1,587,000 contract to Shaw & Estes Inc., Dallas, for reactor facilities at the Hanford Works. It includes tank work. Another substantial pending plate tonnage is for a pipe project at Glasgow, Mont., air base. Chicago Bridge & Iron Co., Seattle, is low

bidder at $40,865 for an elevated tank near Seattle.

Ingalls Shipbuilding Corp., Birmingham, has been awarded a contract to build ten open hopper barges for Mississippi Valley Barge Line Co. They will be 195 ft long and 45 ft wide, with a cargo capacity of 1400 tons each.

Plate fabricators hold small backlogs, and competition for new business is keen.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 113 & 114

Inquiry for the tonnage flat-rolled items (hot and cold rolled sheets) continues to improve, though auto-motive demand is less pressing than it was in recent weeks. Deliveries are largely unchanged, with hot-rolled shipments ranging three to four weeks, and cold-rolled five to six. Upon occasion, shorter deliveries are possible.

The relative stability of deliveries indicates that production is keeping pace with the increase in demand. Strip steel deliveries are possible for December.

Auto business has tapered off as result of inventory buildups during October. The carmakers are not using as much steel as had been anticipated, but miscellaneous manufacturing requirements, including appliances, are still expanding. Electrical sheet needs have picked up some on appliance account. Silicon sheets now can be had in about six weeks, with demand for the lower grades (which go into fractional horsepower motors) relatively better than for the higher grades, required for large generators.

About the hottest flat-rolled product is galvanized sheets. While tonnage isn't being allocated by the mills, the latter are keeping a restrictive hand on orders. A consumer in the Midwest, for example, can't place an order that is much out of line with his recent requirements. Even warehouses, which are not enjoying the boom in orders that the steel mills are experiencing, are getting a good demand for galvanized, and they are finding stock replacements slow. Some makers of galvanized sheets are sold out into February, beyond in a few instances.

While the government is not in

Aftercooler and Cyclone Separator designed for cleaner, dryer compressed air

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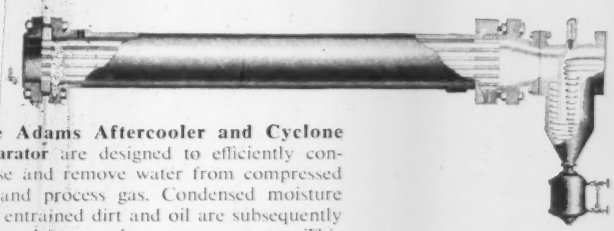
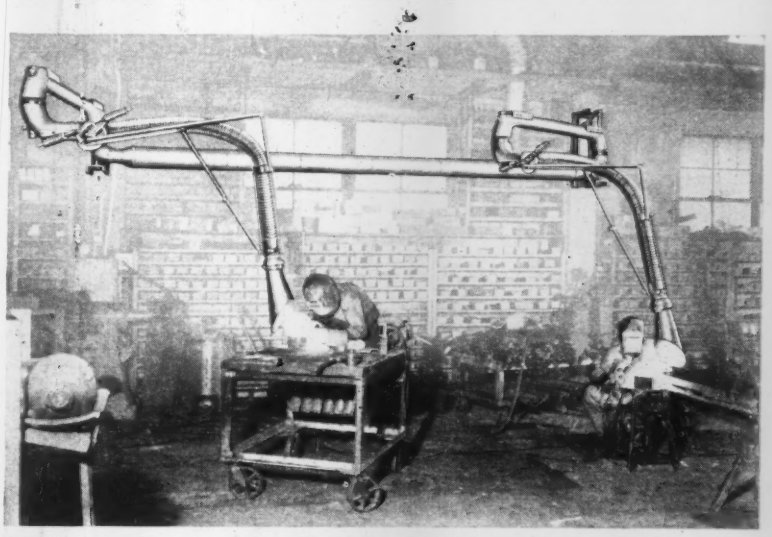


The Adams Aftercooler and Cyclone Separator are designed to efficiently condense and remove water from compressed air and process gas. Condensed moisture and entrained dirt and oil are subsequently removed in a cyclone type separator. This unit is scientifically designed for maximum removal efficiency over a wide range of flow rates.

For normal use, units are available to cool gases to within 10° F of the temperature of the cooling water. Specially designed units are available to permit a 2° F approach to cooling water temperature, for application where low moisture content is critical.

Adams Aftercoolers and Separators are available from stock to handle 20 - 40,000 cfm with 10° cooling and 25 - 19,200 cfm where it is necessary to cool within 2°F of the cooling water. Special units can be supplied to suit an unlimited range of requirements. In all cases the maximum pressure loss at rated capacities is ½ psi.

This wide range of sizes enables the economical utilization of Adams Aftercoolers and Separators in virtually all industrial application. For further information on how R. P. Adams' units will solve your compressed air problems and save you money, write today for Bulletin 711.



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the grain bin business this year, it is making it easy for farmers to buy and pay for bins, with full ownership in a couple of years. In such circumstances, the farmers can't resist buying, and this is an important facet of the situation in galvanized sheets.

Republic Steel Corp. has issued a revised card of extras on cold-rolled sheets. It makes a number of minor changes in the list effective since Dec. 17, 1956.

Stainless Steel . . .

Stainless Steel Prices, Page 116

New England distributors are slightly increasing their inventories of stainless flat-rolled products and bars. They have been placing heavier orders this month.

General Stores Supply Office, Navy, Philadelphia, has placed 200 tons of stainless sheets, 1100 tons going to Ingersoll Steel Div., Borg-Warner Corp., Chicago, and the balance in two contracts to: Washington Steel Corp., Washington, Pa., and G. A. Feld Co., New York.

Imported Steel Prices Advanced Slightly

After some manuevering, imported steel prices have been stabilized in the Southwest at an average of 5 cents over October levels. Deliveries average two to three months, except for one mill which has a six to seven month range.

Representatives of several French mills are attempting to fill rolling schedules which were knocked full of holes when the De Gaulle government canceled several commitments with the Soviet bloc nations.

Domestic mills lost another round in the fight for home markets in the Southwest when the Louisiana Highway Department rejected a request to ban imported steel in road building projects.

Tubular Goods . . .

Tubular Goods Prices, Page 116

Production of continuous butt-weld pipe is moving ahead steadily. The mills are booking December delivery orders. Favorable weather has contributed to strong demand for construction projects.

A little quickening in demand for oil country tubing is noted at Pittsburgh. One area producer says his November shipments will be second only to those last June when business was stimulated by price-protection ordering. The producer thinks his December shipments will top those in November by at least 10 per cent.

Mechanical tubing is moving in fair volume for this season. The product goes into a multitude of manufactured items, including outdoor swings, playground equipment, lawn furniture, and household equipment. Demand for summer goods probably won't be felt for another 45 to 60 days.

Pig Iron . . .

Pig Iron Prices, Page 119

Most pig iron sellers expect shipments to continue light through the end of the year. Observance of holidays and the desire of consumers to maintain low inventories for yearend accounting considerations will tend to restrict the movement.

Jobbing foundries are operating on low order backlogs (one to two weeks is quite common). Shops which are running more than 32 hours a week are rare.

Blast Furnace Production Rises During October

Blast furnace production (pig iron, ferromanganese, and spiegeleisen) totaled 5,872,958 net tons in October, reports the American Iron & Steel Institute. It compares with output of 5,072,390 net tons in September, and with 6,519,478 in October, 1957.

Of the total October output, 36,963 tons were ferroalloys, vs. 31,348 in September, and 65,028 in October last year.

Production in the first ten months this year totaled 45,754,047 tons, of which 378,676 tons were ferroalloys. In the like period last year, output totaled 68,280,112 tons, of which 647,267 tons were ferroalloys.

Output by states:

Blast Furnace Production—October, 1958
(Net Tons)

States:	October	First Ten Months
Massachusetts, New York	345,533	2,907,083
Pennsylvania	1,452,216	11,904,402
Maryland, Virginia, West Virginia	561,281	4,885,463
Kentucky, Tennessee, Texas	131,479	1,276,382
Alabama	319,707	2,748,619
Ohio	1,093,251	7,474,449
Indiana	791,614	6,173,965
Illinois	491,681	3,195,355
Michigan, Minnesota	384,683	2,470,727
Colorado, Utah, California	301,513	2,717,602
Totals	*5,872,958	**45,754,047

*Includes 36,963 tons of ferroalloys.
**Includes 378,676 tons of ferroalloys.

DISTRICT INGOT RATES
(Percentage of Capacity Engaged)

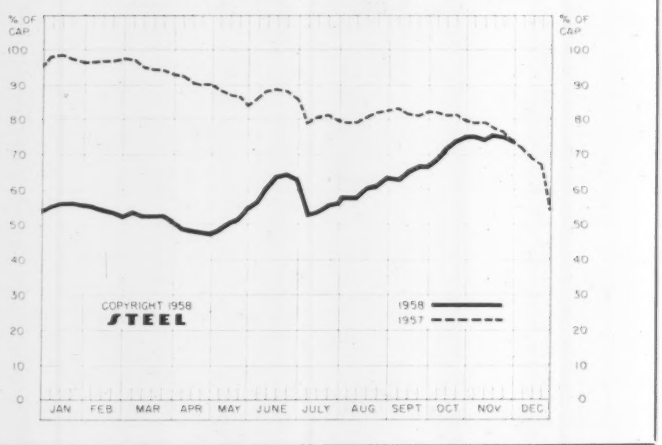
	Week Ended Nov. 30	Change	Same 1957	Week 1956
Pittsburgh	66.5	— 1*	73	96.5
Chicago	85.5	+ 0.5*	74.5	100.5
Eastern	71	0	82	101
Youngstown	59	— 2	71	101
Wheeling	83	— 2	61	102
Cleveland	73	+ 3*	66.5	106.5
Buffalo	68.5	— 9.5	78	107.5
Birmingham	60.5	+ 2.5	63.5	94.5
Cincinnati	82.5	+ 0.5*	81.5	95.5
St. Louis	93	— 5*	87.5	102.5
Detroit	100.5	— 2.5*	89	102
Western	79	+ 1	86	105
National Rate	74	— 1	73.5	100

INGOT PRODUCTION‡

	Week Ended Nov. 30	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	124.7†	124.5	126.0	114.9
NET TONS (In thousands)	2,003†	2,000	2,024	1,846

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,599,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites

Nov. 25, 1958	Week Ago	Month Ago	Nov. Avg	Year Ago
187.4†	187.4	186.7	187.4	181.7

†Preliminary.

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Nov. 25

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.689
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	20.525
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	24.315
		Pipe, Line (100 ft)	205.710
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	26.157	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.653
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Nov. 26 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.38
Index in cents per lb	6.713	6.713	6.713	6.479	5.130

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$146.03	$115.18
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	40.33	40.67	42.00	33.00	34.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Nov. 26 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.35
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.70	4.55
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.975-4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45-5.95
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.475-5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.35-6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods 7/32-5/8" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	Nov. 26 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.01	60.75
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.51	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicaago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$42.50	$42.50	$43.50	$33.50	$35.50
No. 1 Heavy Melt, E. Pa.	36.00	37.00	41.00	33.50	35.00
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	32.00	33.50
No. 1 Heavy Melt, Valley	43.50	43.50	43.50	31.50	34.50
No. 1 Heavy Melt, Cleve.	40.00	40.00	40.00	28.50	32.50
No. 1 Heavy Melt, Buffalo	35.50	35.50	35.50	32.50	34.50
Rails, Rerolling, Chicago	62.50	62.50	62.00	48.00	46.50
No. 1 Cast, Chicago	45.50	45.50	45.50	35.50	34.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, Nov. 26, cents per pound except as otherwise noted. Changes shown in italics. Code number following mill points indicates producing company. Key to producers, page 116, footnotes, page 115.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 ..... 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..... 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton, O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 ..... 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 ..... 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. C8 ..... 99.50
Seattle B3 ..... 113.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 ..... 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..... $119.00
Bridgeport,Conn. C32 ..... 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 ..... 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 ..... 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 ..... 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 ..... 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS
AlabamaCity,Ala. R2 ..... 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 ..... 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
N.Tonawanda,N.Y. B11 ..... 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R6 ..... 6.50
S.Chicago,Ill. R2, W14 ..... 6.40
SparrowsPoint,Md. B2 ..... 6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..... 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 ..... 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..... 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 ..... 5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2.. 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Weirton,W.Va. W6 ..... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14.. 6.80

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 ..... 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..... 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14.. 8.05
S.SanFrancisco B3 ..... 8.70
Struthers,O. Y1 ..... 8.05

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..... 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 .. 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 .. 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 .. 6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 .. 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 .. 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1.. 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 .. 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14.. 5.30
SparrowsPoint,Md. B2 .. 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 .... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 .... 5.30
Youngstown(27) R2 .... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 6.75
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 .. 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 .. 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 .. 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1 .. 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14.. 7.95
SparrowsPoint,Md. B2 .. 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 .... 7.95

PLATES, ALLOY
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L17 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14.. 7.50
SparrowsPoint,Md. B2 .. 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 .. 6.375
Ind.Harbor,Ind. I-2 .. 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 .. 5.55
Ashland l.c.l.(15) A10 .. 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 .. 5.675
Aliquippa,Pa.(9) J5 .. 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 .. 5.675
Birmingham(9) C15 .. 5.675
Buffalo(9) R2 ..... 5.675
Canton,O.(23) R2 ..... 6.15
Clairton,Pa.(9) U5 .... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 .. 5.675
Emeryville,Calif. J7 .. 6.425
Fairfield,Ala.(9) T2 .. 5.675
Fairless,Pa.(9) U5 .... 5.925
Fontana,Calif.(9) K1 .. 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 .. 5.675
Johnstown,Pa.(9) B2 .. 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5.. 5.925
Lackawanna,N.Y.(9) B2 .. 5.675
LosAngeles(9) B3 .... 6.375
Massillon,O.(23) R2 .... 6.15
Midland,Pa.(23) C18 .. 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 .... 6.125
Niles,Calif. P1 ..... 6.375
N.Tonawanda,N.Y.(23) B11 6.025
Owensboro,Ky.(9) G8 .. 6.025
Pittsburg,Calif.(9) C11 6.475
Pittsburgh(9) J5 .... 5.675
Portland,Oreg. O4 .... 6.425
Riverdale,Ill.(9) A1 .. 5.675
Seattle B3, N14 ..... 6.425
S.Chicago(9) R2, U5, W14 5.675
S.Duquesne,Pa.(9) U5 .. 5.675
S.SanFran.,Calif.(9) B3 6.425
Sterling,Ill.(1)(9) N15.. 5.675
Sterling,Ill.(9) N15 .... 5.775
Struthers,O.(9) Y1 .... 5.675
Tonawanda,N.Y. B12 .. 5.675
Torrance,Calif.(9) C11 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 .. 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .... 6.725
Bethlehem,Pa. B2 .... 6.725
Bridgeport,Conn. C32 .. 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 .... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 .... 6.725
Ecorse,Mich. G5 .... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 .... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 6.725
Johnstown,Pa. B2 .... 6.725
KansasCity,Mo. S5 .... 6.975
Lackawanna,N.Y. B2 .. 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 .... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 .... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 .... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 .... 8.30
Johnstown,Pa. B2 .... 8.30
KansasCity,Mo. S5 .... 8.55
Lackawanna,N.Y. B2 .. 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14.. 8.30
S.Duquesne,Pa. U5 .... 8.30
S.SanFrancisco B3 .... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 .. 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9) S5.. 5.925
Lackawanna(9) B2 .... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 .... 5.675
Tonawanda,N.Y. B12 .. 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 .. 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 .... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra)
Carbon
LosAngeles P2, S30 .. 11.75*
Alloy
Ambridge,Pa. W18 .. 10.175
BeaverFalls,Pa. M12 .. 10.175
Camden,N.J. P13 .... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 .... 10.35
SpringCity,Pa. K3 .... 10.35

*Grade A; add 0.050c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .... 7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 ..... 8.25
Buffalo R5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 .... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 .... 7.65
Hammond,Ind. J5, L2 .. 7.65
Hartford,Conn. R2 .... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 .... 9.10
LosAngeles(49) P2, R2 9.10
Mansfield,Mass. B2 .... 8.20
Massillon,O. R2, R8 .... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 .. 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 .... 7.90
Putnam,Conn. W18 .... 8.20
Readville,Mass. C14 .... 8.20
S.Chicago,Ill. W14 .... 7.65
SpringCity,Pa. K3 .... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 .. 8.15
Youngstown F3, Y1 .... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 .... 9.025
Bridgeport,Conn. C32 .. 9.175
Buffalo R5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 .... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 .. 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 .... 9.025
Hammond,Ind. J5, L2 .. 9.025
Hartford,Conn. R2 .... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 .. 9.025
LosAngeles P2, S30 .. 11.00
Mansfield,Mass. B5 .... 9.325
Massillon,O. R2, R8 .... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 .... 9.225
S.Chicago,Ill. W14 .... 9.025
SpringCity,Pa. K3 .... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 .. 9.325
Worcester,Mass. A7 .... 9.325
Youngstown F3, Y1 .... 9.025

BARS, Reinforcing, Billet (To Fabricators)

Alabama City, Ala. B2 ..5.675
Atlanta, A11 ..5.675
Birmingham, C15 ..5.675
Buffalo, B2 ..5.675
Cleveland, R2 ..5.675
Ecorse, Mich. G5 ..5.675
Emeryville, Calif. J7 ..6.425
Fairfield, Ala. T2 ..5.675
Fairless, Pa. U5 ..5.825
Fontana, Calif. K1 ..6.375
Ft. Worth, Tex. (4) (26) T16 6.125
Gary, Ind. U5 ..5.675
Houston, S5 ..5.925
Ind. Harbor, Ind. I-2, Y1 5.675
Johnstown, Pa. B2 ..5.675
Joliet, Ill. P22 ..5.675
Kansas City, Mo. S5 ..5.925
Kokomo, Ind. C16 ..5.775
Lackawanna, N.Y. B2 ..5.675
Los Angeles, B3 ..6.375
Madison, Ill. L1 ..5.875
Milton, Pa. M18 ..5.825
Minnequa, Colo. C10 ..6.125
Niles, Calif. P1 ..6.375
Pittsburg, Calif. C11 ..6.375
Pittsburgh, J5 ..5.675
Portland, Oreg. O4 ..6.125
Sand Springs, Okla. S5 ..5.925
Seattle, B3, N11 ..6.425
S. Chicago, Ill. R2, W14 5.675
S. Duquesne, Pa. U5 ..5.675
S. San Francisco, B3 ..6.425
Sparrows Point, Md. B2 ..5.675
Sterling, Ill. (4) N15 ..5.675
Sterling, Ill. N15 ..5.775
Struthers, O. Y1 ..5.675
Tonawanda, N.Y. B12 ..6.10
Torrance, Calif. C11 ..6.375
Youngstown, R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated to Consumers)

Baltimore, B2 ..7.42
Boston, B2, U8 ..8.15
Chicago, U8 ..7.41
Cleveland, U8 ..7.39
Houston, S5 ..7.60
Johnstown, Pa. B2 ..7.33
Kansas City, Mo. S5 ..7.60
Lackawanna, N.Y. B2 ..7.35
Marion, O. P11 ..6.70
Newark, N.J. U8 ..7.80
Philadelphia, U8 ..7.63
Pittsburgh, J5, U8 ..7.35
Sand Springs, Okla. S5 ..7.60
Seattle, B3, N11 ..7.95
Sparrows Pt., Md. B2 ..7.33
St. Paul, U8 ..8.17
Williamsport, Pa. S19 ..7.25

BARS, Wrought Iron

Economy, Pa. (S.R.) B14 14.90
Economy, Pa. (D.R.) B14 18.55
Economy (Staybolt) B14 19.00

BARS, Rail Steel

Chicago Hts. (3) C2, I-2 5.575
Chicago Hts. (4) (6) I-2 5.675
Chicago Hts. (4) C2 ..5.675
Franklin Pa. (3) F5 ..5.575
Franklin Pa. (4) (6) F5 ..5.675
Jersey Shore Pa. (3) J8 ..5.55
Marion, O. (3) P11 ..5.575
Tonawanda (3) B12 ..5.575
Tonawanda (4) B12 ..6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Alabama City, Ala. R2 ..5.10
Allenport Pa. P7 ..5.10
Aliquippa Pa. J5 ..5.10
Ashland, Ky. (8) A10 ..5.10
Cleveland, J5, R2 ..5.10
Conshohocken Pa. A3 ..5.15
Detroit, St. M1 ..5.10
Ecorse, Mich. G5 ..5.10
Fairfield, Ala. T2 ..5.10
Fairless Pa. U5 ..5.15
Farrell, Pa. S3 ..5.10
Fontana, Calif. K1 ..5.825
Gary, Ind. U5 ..5.10
Geneva, Utah C11 ..5.20
Granite City, Ill. (8) G4 ..5.20
Ind. Harbor, Ind. I-2, Y1 5.10
Irvin, Pa. U5 ..5.10
Lackawanna, N.Y. B2 ..5.10
Mansfield, O. E6 ..5.10
Munhall, Pa. U5 ..5.10
Newport, Ky. A2 ..5.10
Niles, O. M21, S3 ..5.10
Pittsburg, Calif. C11 ..5.80
Pittsburgh, J5 ..5.10
Portsmouth, O. P12 ..5.10
Riverdale, Ill. A1 ..5.10
Sharon, Pa. S3 ..5.10
S. Chicago, Ill. U5, W14 ..5.10
Sparrows Point, Md. B2 ..5.10
Steubenville, O. W10 ..5.10
Warren, O. R2 ..5.10
Weirton, W.Va. W6 ..5.10
Youngstown, U5, Y1 ..5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles, O. M21, S3 ..6.275

SHEETS, H.R. Alloy

Ind. Harbor, Ind. Y1 ..8.40
Irvin, Pa. U5 ..8.40
Munhall, Pa. U5 ..8.40
Newport, Ky. A2 ..8.40
Youngstown, U5, Y1 ..8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa, Pa. J5 ..7.525
Ashland, Ky. A10 ..7.525
Cleveland, J5, R2 ..7.525
Conshohocken, Pa. A3 ..7.575
Ecorse, Mich. G5 ..7.525
Fairfield, Ala. T2 ..7.525
Fairless, Pa. U5 ..7.575
Farrell, Pa. S3 ..7.525
Fontana, Calif. K1 ..8.25
Gary, Ind. U5 ..7.525
Ind. Harbor, Ind. I-2, Y1 7.525
Irvin, Pa. U5 ..7.525
Lackawanna (35) B2 ..7.525
Munhall, Pa. U5 ..7.525
Niles, O. S3 ..7.525
Pittsburgh, J5 ..7.525
S. Chicago, Ill. U5, W14 7.525
Sharon, Pa. S3 ..7.525
Sparrows Point (36) B2 ..7.525
Warren, O. R2 ..7.525
Weirton, W.Va. W6 ..7.525
Youngstown, U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland, Ky. (8) A10 ..5.35
Cleveland, R2 ..5.875
Warren, O. R2 ..5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland, R2 ..7.05
Middletown, O. A10 ..6.775
Warren, O. R2 ..7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Alabama City, Ala. R2 ..6.275
Allenport, Pa. P7 ..6.275
Aliquippa, Pa. J5 ..6.275
Cleveland, J5, R2 ..6.275
Conshohocken, Pa. A3 ..6.325
Detroit, M1 ..6.275
Ecorse, Mich. G5 ..6.275
Fairfield, Ala. T2 ..6.325
Follansbee, W.Va. F4 ..6.275
Fontana, Calif. K1 ..7.40
Gary, Ind. U5 ..6.275
Granite City, Ill. G4 ..6.375
Ind. Harbor, Ind. I-2, Y1 6.275
Irvin, Pa. U5 ..6.275
Lackawanna, N.Y. B2 ..6.275
Mansfield, O. E6 ..6.275
Middletown, O. A10 ..6.275
Newport, Ky. A2 ..6.275
Pittsburg, Calif. C11 ..7.225
Pittsburgh, J5 ..6.275
Portsmouth, O. P12 ..6.275
Sparrows Point, Md. B2 ..6.275
Steubenville, O. W10 ..6.275
Warren, O. R2 ..6.275
Weirton, W.Va. W6 ..6.275
Yorkville, O. W10 ..6.275
Youngstown, Y1 ..6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa, Pa. J5 ..9.275
Cleveland, J5, R2 ..9.275
Ecorse, Mich. G5 ..9.275
Fairless, Pa. U5 ..9.325
Fontana, Calif. K1 ..10.40
Gary, Ind. U5 ..9.275
Ind. Harbor, Ind. I-2, Y1 9.275
Irvin, Pa. U5 ..9.275
Lackawanna (37) B2 ..9.275
Pittsburgh, J5 ..9.275
Sparrows Point (38) B2 ..9.275
Warren, O. R2 ..9.275
Weirton, W.Va. W6 ..9.275
Youngstown, Y1 ..9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala. City, Ala. R2	7.225	....
Ashland, Ky. A10	7.225	7.475
Canton, O. R2	7.225	7.75
Fairfield, T2	7.225	7.475
Gary, Ind. U5	7.225	7.475
Granite City, Ill. G4	7.325	....
Ind. Harbor, I-2	7.225	7.475
Irvin, Pa. U5	7.225	7.475
Kokomo, Ind. C16	7.325	....
Martins Fry., W10	7.225	7.475
Pitts., Calif. C11	7.975	....
Sparrows Pt., B2	7.225	....
Pittsburgh, J5	7.225	....

SHEETS, Culvert—Pure Iron

Ind. Harbor, Ind. I-2 ..7.475

SHEETS, Galvanized Steel Hot-Dipped

Alabama City, Ala. R2 ..6.875†
Ashland, Ky. A10 ..6.875†
Canton, O. R2 ..6.875‡
Dover, O. E6 ..6.875†
Fairfield, Ala. T2 ..6.875†
Gary, Ind. U5 ..6.875†
Granite City, Ill. G4 ..6.975*
Ind. Harbor, Ind. I-2 ..6.875†
Irvin, Pa. U5 ..6.875†
Kokomo, Ind. C16 ..6.975‡
Martins Ferry, O. W10 ..6.875*
Middletown, O. A10 ..6.875†
Pittsburg, Calif. C11 ..7.625*
Pittsburgh, J5 ..6.875†
Sparrows Pt., Md. B2 ..6.875†
Warren, O. R2 ..6.875†
Weirton, W.Va. W6 ..6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana, Calif. K1 ..7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin, Pa. U5 ..10.125
Sparrows Pt. (39) B2 ..10.025
Pittsburgh J5 ..10.125

SHEETS, Galvannealed Steel

Canton, O. R2 ..7.275
Irvin, Pa. U5 ..7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland, Ky. A10 ..7.125
Middletown, O. A10 ..7.125

SHEETS, Electrogalvanized

Cleveland (28) R2 ..7.65
Niles, O. (28) R2 ..7.65
Youngstown J5 ..7.50
Weirton, W.Va. W6 ..7.50

SHEETS, Aluminum Coated

Butler, Pa. A10 (type 1) 9.525
Butler, Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland, Ky. A10 ..6.775
Cleveland R2 ..6.775
Fairfield, Ala. T2 ..6.775
Gary, Ind. U5 ..6.775
Granite City, Ill. G4 ..6.875
Ind. Harbor, Ind. I-2, Y1 6.775
Irvin, Pa. U5 ..6.775
Middletown, O. A10 ..6.775
Niles, O. M21, S3 ..6.775
Youngstown Y1 ..6.775

BLUED STOCK, 29 Gage

Dover, O. E6 ..8.70
Follansbee, W.Va. F4 ..8.70
Ind. Harbor, Ind. I-2 ..8.70
Mansfield, O. E6 ..8.70
Warren, O. R2 ..8.70
Yorkville, O. W10 ..8.70

SHEETS, Long Terne, Steel (Commercial Quality)

Beech Bottom, W.Va. W10 7.225
Gary, Ind. U5 ..7.225
Mansfield, O. E6 ..7.225
Middletown, O. A10 ..7.225
Niles, O. M21, S3 ..7.225
Warren, O. R2 ..7.225
Weirton, W.Va. W6 ..7.225

SHEETS, Long Terne, Ingot Iron

Middletown, O. A10 ..7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N. Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M2 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Mercer Pipe Div., Sawhill Tubular Products
M6 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N20 Northwestern S.&W. Co.
N30 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1.5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2.5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago W14 .....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 ....8.40
S.Chicago,Ill. W14 .....8.40
Youngstown U5, Y1 ...8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2,Y1.7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3.8.325
SparrowsPoint,Md. B2 .7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ....7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20 ..7.425
Dover, O. G6 .....7.425
Evanston,Ill. M22 ....7.525
Farrell, Pa. S3 .....7.425
Follansbee,W.Va. F4 ..7.425
Fontana,Calif. K1 ....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ....7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ....7.525
NewBedford,Mass. R10 7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5 ..7.425
NewHaven,Conn. D2 ..7.875
NewKensington,Pa. A6 7.425
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 ....7.425
Worcester,Mass. A7 ..7.975
Youngstown S41, Y1 ..7.425
Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ..15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy
STRIP, Cold-Rolled Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ....10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	....	18.85	22.95	27.80
Buffalo W12	....	18.85	....	....
Fostoria,O. S1	....	19.05	22.15	....
FranklinPark,Ill. T6	....	19.20	23.30	28.15
Harrison,N.J. C18	....	18.85	22.95	27.80
NewYork W3	....	18.85	22.95	27.80
Palmer,Mass. W12	....	18.85	....	....
Trenton,N.J. R5	....	18.85	22.95	27.80
Worcester,Mass. A7, T6	....	18.85	22.95	27.80
Youngstown S41	....	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ....7.50*
Riverdale,Ill. A1 .....7.525*
Warren,O. B9, S3, T5 7.425*
Worcester,Mass. A7 ..7.975
Youngstown S41 .....7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (20-27 Ga.; Dollars per 100 lb)

Aliquippa,Pa. J5	7.90	8.10	....
Niles,O. R2	*7.90*	*8.10*	*8.30*

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$8.20
Fairfield,Ala. T2 .....8.30
Fairless,Pa. U5 .....8.30
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 .....8.20
GraniteCity,Ill. G4 ....8.30
Ind.Harbor,Ind. I-2, Y1.8.20
Irvin,Pa. U5 .....8.20
Niles,O. R2 .....8.20
Pittsburg,Calif. C11 ....8.85
SparrowsPoint,Md. B2..8.25
Weirton,W.Va. W6 ....8.20
Yorkville,O. W10 .....8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....7.85
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 ....7.95
Ind.Harbor,Ind. Y1 ....7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$9.70
Irvin,Pa. U5 .....9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5 .....$11.25

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65
Vandergrift,Pa. U5	....	....	....	....	Stator 8.10
Mansfield,O E6	....	....	....	....	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70-
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed, † Fully processed only, ‡Coils, annealed, semiprocessed ½c lower, ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ....8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 .....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 .....8.00
Crawfordsville,Ind. M8 .8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 .....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ....8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 .....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 .....8.25
Monessen,Pa. P7, P16 .....8.00
N.Tonawanda,N.Y. B11 ..8.00
Palmer,Mass. W12 .....8.30
Pittsburg,Calif. C11 .....8.95
Portsmouth,O. P12 .....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 .....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 .....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 .....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 .....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
Minnequa,Colo. C10 ....12.775
Monessen,Pa. P7, P16 ..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ....12.95
Palmer,Mass. W12 .....13.70
Pittsburg,Calif. C11 ....13.45
Portsmouth,O. P12 .....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ....13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 .....12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5 .....10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 .....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ....10.05
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ....10.70
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 .....10.70
SparrowsPt.,Md. B2 ..9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 .....10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 .....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5 .....10.00
LosAngeles B3 .....10.70
Millbury,Mass.(12) N6 ..10.05
Minnequa,Colo. C10 .....9.95
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ....10.70
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 .....10.70
SparrowsPt.,Md. B2 ..9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass.A7,J4T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 .....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ....16.65
Johnstown,Pa. B2 .....16.30
KansasCity,Mo. S5 .....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10 .....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 .....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 .....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE (A)

Bartonville,Ill. K4 .....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
Johnstown,Pa. B2 .....13.45
Monessen,Pa. P7 .....13.45
Muncie,Ind. I-7 .....13.65
Palmer,Mass. W12 .....13.75
Portsmouth,O. P12 .....13.45
Roebling,N.J. R5 .....13.75
St.Louis L8 .....*13.45*
SparrowsPt.,Md. B2 ..13.55
Struthers,O. Y1 .....13.45
Worcester,Mass. J4 .....13.75
(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg)

To Dealers (33)

Wheeling,W.Va. W10	$9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Sterling,Ill.(1) N15	177
Tonawanda,N.Y. B12	172

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Allq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
AlaCity,Ala. R2	17.85	19.40**
Allq'ppa,Pa. J5	17.85	19.65§
Bartonville K4	17.95	19.75
Cleveland A7	17.85	—
Craw'ysville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	—
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
SparrowsPt. B2	17.95	19.75§
Sterling(37) N15	17.25	19.05††
Waukegan A7	17.85	19.40†
Worcester A7	18.15	—

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48) A11	9.10	9.775§
Bartonville(48) K4	9.10	9.775
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	—
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown B2(48)	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) C16	9.10	9.65†
LosAngeles B3	9.95	10.675§
Monessen (48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
SparrowsPt. (48) B2	9.10	9.775§
Sterling(48) N15	9.25	9.925††
St'ling(1)(48) N15	9.15	9.825††
Struthers,O. Y1	9.00	9.65‡
Worester,Mass. A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1¼ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, standard heavy double chamfered hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam.	50.0
⅞ in. diam.	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam.	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

⅜ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

⅜ in. and smaller, 6 in. and shorter +85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85
⅞ in. and smaller by 6 in. and shorter: 15.0%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2¾	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.50
Johnstown,Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.22
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	7.025
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cold. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.285c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.875c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood W. Va. W10	1.5	+27	+10.5	+36	+21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+7.75
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	0.5	+28	+11.5	+37	+22	+45.5	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.25	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI	—Rerolling—		Forging	H.R.	H.R. Rods; C.F.	Bars; Structural			C.R. Strip	
Type	Ingot	Slabs	Billets	Strip	Wire	Shapes	Plates	Sheets	Wire	Flat
201	22.00	27.00	....	36.00	40.00	42.00	39.25	48.50	45.00	
202	23.75	30.25	36.50	39.00	40.75	43.00	40.00	49.25	45.25	
301	23.25	28.00	37.25	37.25	42.00	44.25	41.25	51.25	47.50	
302	25.25	31.50	38.00	40.50	42.75	45.00	42.25	52.00	52.00	
302B	25.50	32.75	40.75	43.75	45.00	47.25	44.50	57.00	57.00	
303	....	32.00	41.00	46.00	45.50	48.00	45.00	56.75	56.75	
304	27.00	33.25	40.50	44.25	45.25	47.75	45.75	55.00	55.00	
304L	....	....	48.25	51.50	53.00	55.50	53.50	63.25	63.25	
305	28.50	36.75	42.50	47.50	45.25	47.75	46.25	58.75	58.75	
308	30.75	38.25	47.25	50.25	52.75	55.75	55.25	63.00	63.00	
309	39.75	49.50	57.75	64.50	63.75	67.00	66.00	80.50	80.50	
310	49.75	61.50	78.00	84.25	86.50	91.00	87.75	96.75	96.75	
314	....	....	77.50	....	86.50	91.00	87.75	99.00	104.25	
316	39.75	49.50	62.25	69.25	73.00	71.75	80.75	80.75	80.75	
316L	....	55.50	70.00	76.50	77.00	80.75	79.50	89.25	89.25	
317	48.00	60.00	76.75	88.25	86.25	90.75	88.50	101.00	101.00	
321	32.25	40.00	47.00	53.50	52.50	55.50	54.75	65.50	65.50	
330	....	....	118.75	....	132.00	138.50	135.50	149.25	149.25	
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	64.75	79.25	79.25	
403	....	....	28.25	....	32.00	33.75	30.00	40.25	40.25	
405	19.50	25.50	29.75	36.00	33.50	35.25	32.50	46.75	46.75	
410	16.75	21.50	28.25	31.00	32.00	33.75	30.00	40.25	40.25	
416	....	....	28.75	....	32.50	34.25	31.25	48.25	48.25	
420	26.00	33.50	34.25	41.75	39.25	41.25	40.25	62.00	62.00	
430	17.00	21.75	28.75	32.00	32.50	34.25	31.00	40.75	40.75	
430F	....	....	29.50	....	33.00	34.75	31.75	51.75	51.75	
431	....	28.75	37.75	....	42.00	44.25	41.00	56.00	56.00	
446	....	....	39.25	59.00	44.25	46.50	42.75	70.00	70.00	

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co., Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp., Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets—Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	34.75	40.65

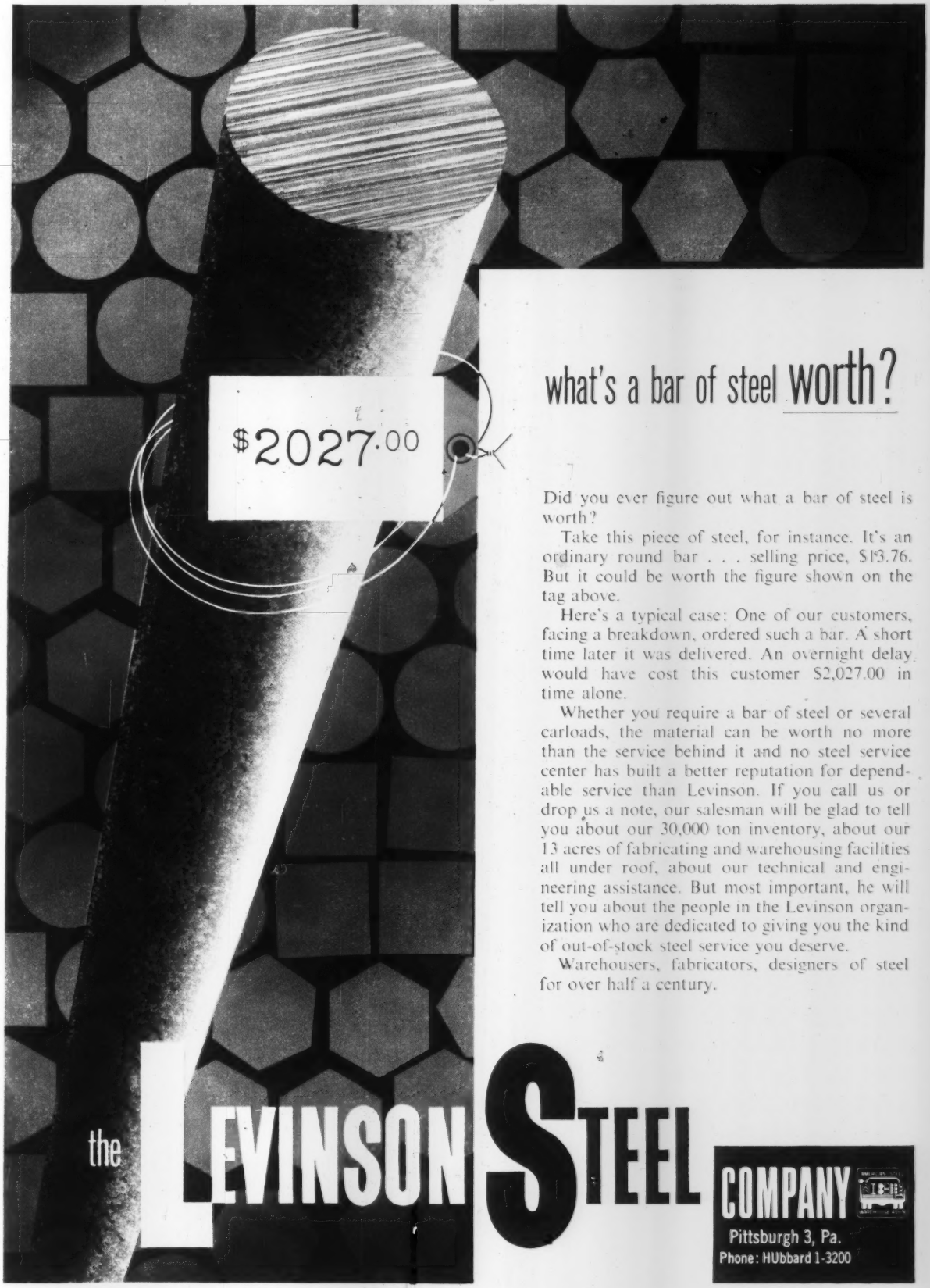
*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3. nickel, inconel monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
18	4	3	....	....	T-3	2.105
13.5	4	3	....	....	T-4	2.545
18.25	4.25	1	4.75	....	T-5	2.915
18	4	2	9	....	T-6	4.330
20.25	4.25	1.6	12.95	....	T-8	2.485
13.75	3.75	2	5	....	M-1	1.200
1.5	4	1	....	8.5	M-2	1.345
6.4	4.5	1.9	....	5	M-3	1.590
6	4	3	....	6		

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.



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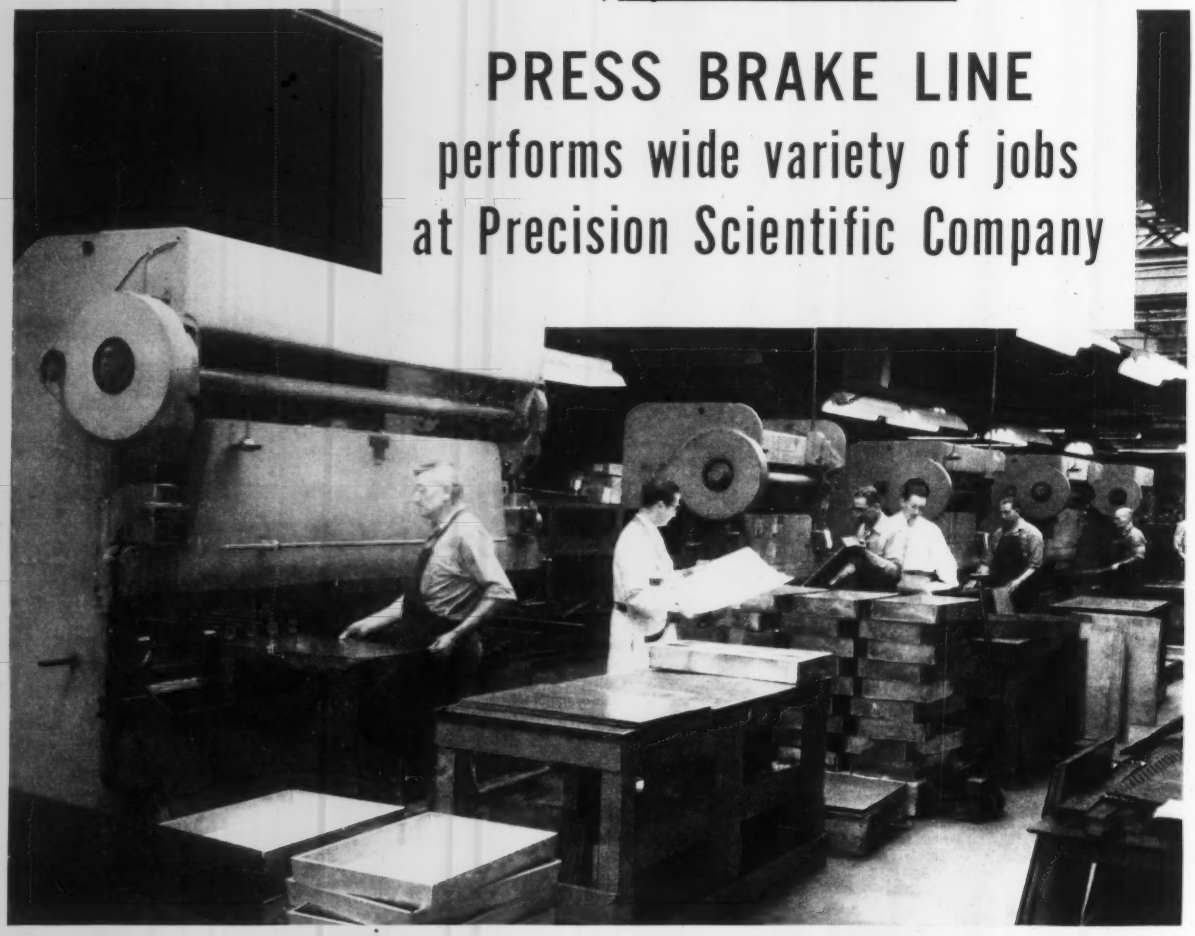

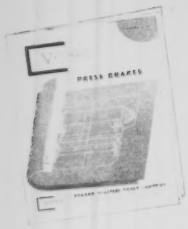

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Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.50*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y., T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville Homestead, Wilmerding,Monica,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malleable	Bessemer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O H. & Fdry. 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS			STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.99
Boston	9.31	10.40	11.39	53.50	9.73	10.11	13.39#	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	11.80	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.55	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	10.65	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	10.87	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.20	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.15[3]	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	10.64	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	11.10	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.20	9.25	11.34	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	10.88	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.09	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.00	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	9.95	11.52[2]	12.15[2]	55.02	10.00	10.10	14.70	16.80[2]	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.55	12.50	57.38	10.55	10.65	14.70	16.80	9.80	9.70	12.10
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **½ in. and heavier; ††as annealed; ‡‡⅝ in. to 4 in. wide inclusive; #net price. 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $168; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $253; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $310.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ¼ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over. F.o.b. Riverton or Camden, N. J., west of Mississippi River.	10.50 9.50
Sponge Iron, Domestic, 99 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500-lb drum, freight allowed	
Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.00-48.90†
Bronze, 5000-lb lots	49.60-53.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	50.99-55.40†
Phosphor-Copper, 5000-lb lots	61.80
Copper (atomized) 5000-lb lots	42.30-50.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20†
Tungsten: Melting grade, 99% 60 to 200 mesh, nominal:	Dollars
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	*$5.10*	*$5.10*	*$5.00*	*$5.45*
Bar Size Angles	*5.00*	*5.00*	*4.90*	*5.33*
Structural Angles	*5.00*	*5.00*	*4.90*	*5.33*
I-Beams	*5.06*	*5.06*	*4.96*	*5.40*
Channels	*5.06*	*5.06*	*4.96*	*5.40*
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	*5.15*	*5.28*	*5.10*	*5.45*
Wire Rods, O.H. Cold Heading Quality No. 5	*6.05*	*6.18*	*6.00*	*6.30*
Bright Common Wire Nails (§)	*7.89*	*7.75*	*7.67*	*8.26*

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	18.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	26.00

Tungsten Ore

Net ton, unit

Foreign ofhramite, good commerfical quality	$11.20-$11.25*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $1.10 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00
South African Transvaal	
44% no ratio	22.00-23.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00
Domestic	
Rail nearest seller	
48% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	31.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.65
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.18
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $5.15 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	31.00‡
Toluene, one deg. (deld.)	25.00*
Industrial xylene	29.00§

Per ton, bulk, ovens

Ammonium sulfate	$32.00-35.00†

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Effective: *Apr. 12; †July 1; ‡July 8; §Aug.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomaganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy, Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, 8M x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si. 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade, (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.6c per lb of contained Si. Packed c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing min 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4 % B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%) Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅜ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.80c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Contract, carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lots $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ⅛-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Deliveried.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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Wire . . .

Wire Prices, Pages 114 & 115

Manufacturers wire is being turned out in steadily growing volume. Production has been rising slowly for weeks and is now considered about "normal" at some producing points. Expectations are that wire items will move faster from here out with automotive consumption stepping up. The automakers have released substantial tonnage on producers' books, and more orders are reported coming in. This is the off-season for merchant wire, but buying for spring needs will be starting soon.

While New England wiremakers report a slight decline in their bookings for December shipment, they expect a January rebound in orders. Heavy inventories of finished goods made of wire have been lowered, and this should mean increased pressure on the wiremakers.

Imports of low and medium carbon rods are heavier, and more suppliers of finished wire for the building trades are drawing their product from imported rods—bright wire in some cases.

Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, has started marketing a new extra high strength wire rope under the tradename, Double Gray. It has been field tested on rotary rigs, dozers, shovels, draglines, scrapers, tractors, arch tractors, and every type of machine that imposes heavy loads on rope.

Tin Plate . . .

Tin Plate Prices, Page 114

Under a new policy, American Can Co., New York, will establish separate f.o.b. prices at each of its plants for each type and style of can, replacing average prices applying over broad areas.

The new policy and economies effected by the company's coil processing program will lower can prices, resulting in aggregate savings to customers of over $9 million, William C. Stolk, president, says.

The company will hold the line on prices until Oct. 1, 1959, except for adjustments that may be necessary to reflect increases in tin plate prices.

Jones & Laughlin Steel Corp., Pittsburgh, has issued a new card covering extras and deductions on tin mill products, replacing one in effect since April 30, 1957. Only two minor changes are involved.

Rails, Cars . . .

Track Material Prices, Page 115

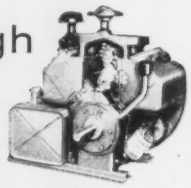
The Missouri Pacific Railroad plans a $15 million modernization program, the largest proposal being $4,279,000 for work on the new $13 million electronic classification yard at Kansas City, Mo.

The Louisville & Nashville Railroad has ordered 3000 seventy-ton coal hoppercars from the Bessemer, Ala., plant of Pullman-Standard Car Mfg. Co. They will cost an estimated $28 million.

The order means immediate reopening of the Bessemer plant, which has been closed since mid-August. Manufacture of the cars will begin Dec. 1.

Pullman-Standard will recall 300 to 400 workers early next year at its Pullman Car Works in Chicago. The company has booked an order for 36 doubledeck commuter cars from the Chicago & North Western Railway.

30 "HORSES" with a high LUGGING FACTOR



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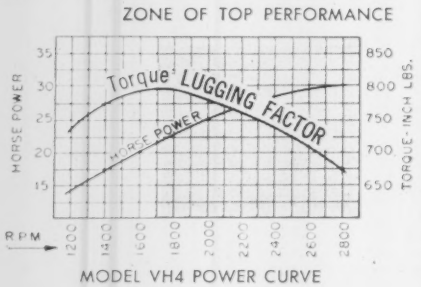

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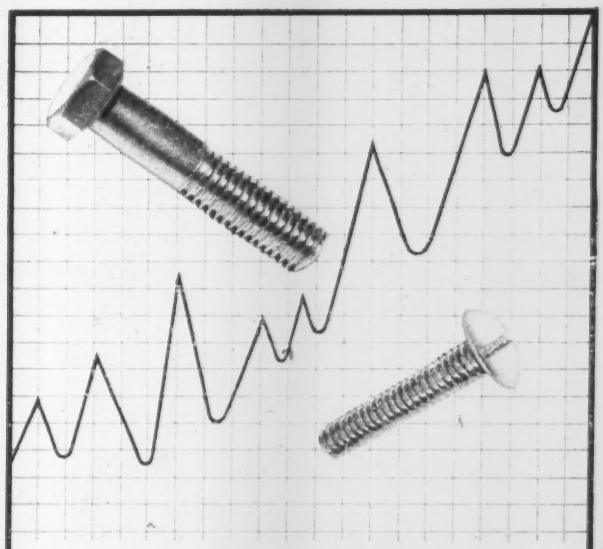

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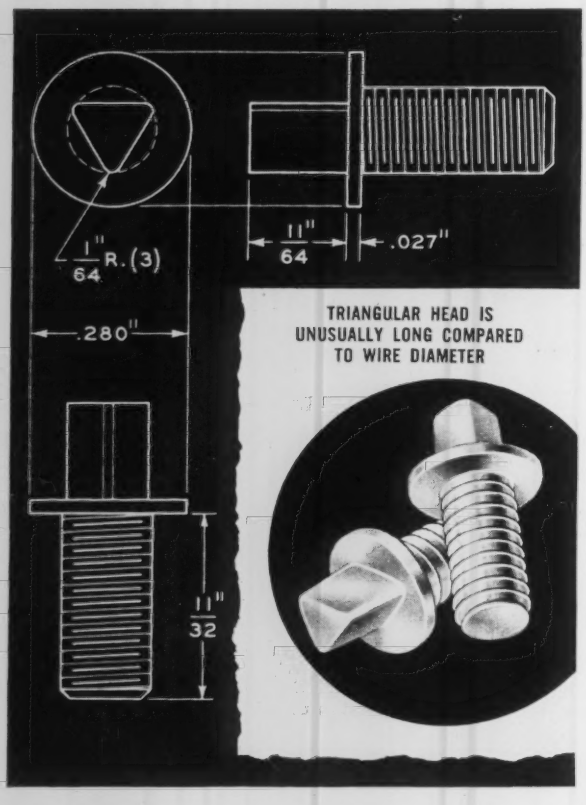

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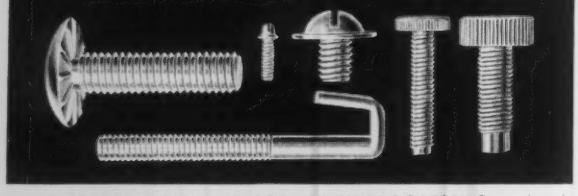

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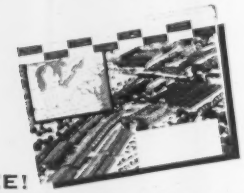

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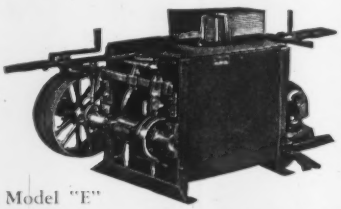

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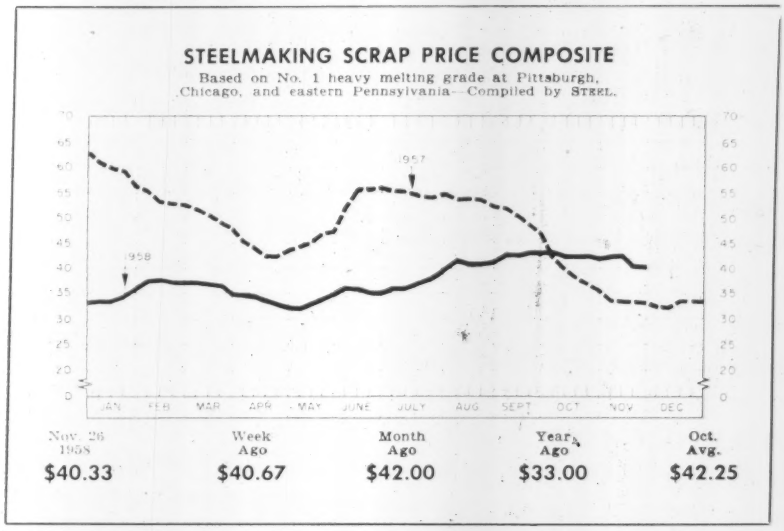

STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
Nov. 26 1958 $40.33
Week Ago $40.67
Month Ago $42.00
Year Ago $33.00
Oct. Avg. $42.25

Scrap Index Is Still Slipping

STEEL's composite on the prime grade declines another 34 cents a ton to $40.33. Mill buying interest sags as the holiday season and inventory-taking period approach

Scrap Prices, Page 126

Philadelphia—Major grades of open hearth scrap have eased further under the influence of light buying and dull prospects for the near future. Mills hold substantial stocks. Little new foreign demand is in sight.

No. 1 heavy melting, No. 1 bundles, and No. 1 busheling are down $1 to $36, delivered. No. 2 heavy melting is also down $1 to $33, while No. 2 bundles are off 50 cents to $23, delivered. Other steel grades are unchanged, but easy, with quotations on borings and turnings largely nominal. Prices on heavy breakable cast are easier at $42, and drop broken machinery at $48-$49.

New York—Brokers' buying prices on most major grades of scrap are unchanged, but they are largely nominal. An exception is a $1 reduction in low phos structurals and plates to $35-$36. Unstripped motor blocks are off sharply to $24-$25. Stainless steel scrap prices also have dropped substantially, brokers paying $185-$190 for 18-8 sheets, clips and solids, and $85-$90 for 18-8 borings and turnings, reductions of $5 in each case. On Type 410 sheets, clips and solids, $55-$60 is quoted, and on Type 430 material, $75-$80, a drop of $10 a ton in each case. Consumptive demand for stainless appears to have suddenly dried up, with little improvement in immediate prospect.

Chicago—Scrap prices are holding in a market that is more inactive than it has been in many months. Most steel mills are out of the market, and the one or two that do keep a finger in are specifying tonnages so small that no price test is provided. Some brokers point out that price is not of any great concern—the problem is orders. The great need is to get tonnage moving again. Steelmaking seems likely to hold close to the present level the rest of this year.

Pittsburgh—The market is lifeless. Even the one steel mill that's been buying small lots in recent weeks now is out of the market. Dealers and brokers are standing pat on prices, which are largely nominal in the absence of representative buying.

Cleveland—So little dealer scrap is being bought by the steel mills, the market is at a virtual standstill despite a 3-point jump in the district steel rate to 73 per cent last week. Not much buying is anticipated until after the turn of the year. Meanwhile, prices are unchanged, but nominal. Bids on monthend auto lists will point the way for prices the rest of this year.

Youngstown — The market remains listless; steelmakers are not inclined to place additional orders. There have been no recent sales. One blast furnace operator who has been using some machine shop turnings in his furnace burden has increased his ore charge.

Buffalo—With district steel operations sliding, the outlook for scrap is not encouraging. Prices are unchanged, but there is a softer market undertone, and some dealers look for lower prices when the mills begin placing their December tonnage orders.

Scrap is flowing freely; most holders apparently are convinced that prices are not going to advance soon. Small plants are showing less interest in material with year-end inventory taking near.

St. Louis—A little more scrap is being received by dealers here, largely because the mild weather has spurred collections. Supply and demand are pretty much in balance, but there's nothing in the situation to indicate an increase in prices is in prospect.

Cincinnati — Brokers' prices on the principal steelmaking grades have been lowered $1 a ton. No. 1 heavy melting is now quoted $37.50-$38.50. The lower prices are expected to bring out some new orders.

Birmingham — Practically no scrap is moving in this district. Any purchases the rest of this year will probably be limited. Recent small sales of No. 2 steel were at reduced prices; while dealers are resisting the pressure for lower prices, expectations are new purchases will be made below current levels. Consumers' stockpiles are substantial. The Atlanta steel mill continues closed down by a strike. Negotiations are deadlocked.

Houston—December will be one of the slowest months of the year for the local scrap industry. No significant buying is expected. The Houston mill has stretched out deliveries on a November order, and export prospects are not promising. Mexican buyers are not showing any

(*Please turn to Page* 131)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Nov. 26, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Nov. 26	$40.33
Nov. 19	40.67
Oct. Avg.	42.25
Nov. 1957	33.17
Nov. 1953	35.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	42.00-43.00
No. 2 heavy melting	33.00-34.00
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	30.00-31.00
No. 1 busheling	42.00-43.00
No. 1 factory bundles	49.00-50.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals:	
2 ft and under	49.00-50.00
3 ft lengths	48.00-49.00
Heavy turnings	34.00-35.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	49.00-50.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Random rails	54.00-56.00
Railroad specialties	52.00-53.00
Angles, splice bars	52.00-53.00
Rails, rerolling	60.00-61.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	125.00-130.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt. indus.	43.00-45.00
No. 1 heavy melt. dealer	40.00-41.00
No. 2 heavy melting	34.00-35.00
No. 1 factory bundles	47.00-48.00
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	29.00-30.00
No. 1 busheling, indus.	43.00-45.00
No. 1 busheling, dealer	40.00-41.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 3 ft	46.00-47.00
Punchings & plate scrap	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	43.00-44.00
Unstripped motor blocks	37.00-38.00
Clean auto cast	51.00-52.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
R.R. malleable	55.00-56.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Angles, splice bars	54.00-55.00
Axles	67.00-68.00
Rails, rerolling	62.00-63.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*42.00-43.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 busheling	*42.00-43.00*
No. 1 bundles	*42.00-43.00*
No. 2 bundles	*29.00-30.00*
Machine shop turnings	15.00-16.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	*44.00-45.00*
Electric furnace bundles	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*44.00-45.00*

CLEVELAND

No. 1 heavy melting	*38.50-39.50*
No. 2 heavy melting	*25.00-26.00*
No. 1 factory bundles	*43.00-44.00*
No. 1 bundles	*38.50-39.50*
No. 2 bundles	*28.50-29.50*
No. 1 busheling	*38.50-39.50*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	*40.00-41.00*
Cut structurals, plates 2 ft and under	*47.00-48.00*
Low phos. punchings & plate	*40.00-41.00*
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	37.00-38.00
Heavy breakable cast	36.00-37.00
Stove plate	43.00-44.00
Unstripped motor blocks	32.00-33.00
Brake shoes	36.00-37.00
Clean auto cast	49.00-50.00
Burnt cast	33.00-34.00
Drop broken machinery	49.00-50.00

Railroad Scrap

R.R. malleable	63.00-64.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	43.00-44.00
Angles, splice bars	50.00-51.00
Rails, rerolling	56.00-57.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	205.00-215.00
18-8 turnings	115.00-120.00
430 clips, bundles, solids	110.00-120.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	40.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	20.00†
Short shovel turnings	22.00†

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	39.00
Clean auto cast	49.00
Stove plate	46.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.50
Rails, 18 in. and under	52.00†
Rails, random lengths	48.00
Rails, rerolling	60.00
Angles, splice bars	48.00

BIRMINGHAM

No. 1 heavy melting	36.00-37.00†
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	36.00-37.00†
No. 2 bundles	*21.00-22.00*
No. 1 busheling	36.00-37.00†
Cast iron borings	13.00-14.00
Machine shop turnings	24.00-25.00
Short shovel turnings	25.00-26.00
Bars, crops and plates	44.00-45.00
Structurals & plates	43.00-44.00
Electric furnace bundles	40.00-41.00
Electric furnace:	
2 ft and under	38.00-39.00
3 ft and under	37.00-38.00

Cast Iron Grades

No. 1 cupola	54.00-55.00
Stove plate	53.00-54.00
Unstripped motor blocks	42.00-43.00
Charging box cast	29.00-30.00
No. 1 wheels	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 18 in. and under	52.00-53.00
Rails, rerolling	58.00-59.00
Rails, random lengths	47.00-48.00
Angles, splice bars	47.00-48.00

PHILADELPHIA

No. 1 heavy melting	*36.00*
No. 2 heavy melting	*33.00*
No. 1 bundles	*36.00*
No. 2 bundles	*25.00*
No. 1 busheling	*36.00*
Electric furnace bundles	37.00
Mixed borings, turnings	20.00-21.00†
Short shovel turnings	23.00-24.00†
Machine shop turnings	19.00-20.00†
Heavy turnings	33.00
Structurals & plate	39.00-40.00
Couplers, springs, wheels	42.00-43.00
Rails, crops, 2 ft & under	57.00-58.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	*42.00*
Malleable	58.00
Drop broken machinery	*48.00-49.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	19.00-20.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	11.00-12.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plates)	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	*24.00-25.00*
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips solids	*185.00-190.00*
18-8 borings, turnings	*85.00-90.00*
410 sheets, clips, solids	*55.00-60.00*
430 sheets, clips, solids	*75.00-80.00*

BUFFALO

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	35.00-36.00
No. 2 bundles	27.00-28.00
No. 1 busheling	35.00-36.00
Mixed borings, turnings	17.00-18.00
Machine shop turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	17.00-18.00
Low phos. structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	48.00-49.00
Rails, 3 ft and under	54.00-55.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*37.50-38.50*
No. 2 heavy melting	*32.50-33.50*
No. 1 bundles	*37.50-38.50*
No. 2 bundles	26.00-27.00
No. 1 busheling	*37.50-38.50*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	17.00-20.00
Short shovel turnings	22.00-23.00
Cast iron borings	19.00-20.00
Low phos., 18 in.	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	38.00-39.00
Charging box cast	36.00-37.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	49.00-50.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	40.00
No. 2 heavy melting	34.00
No. 1 bundles	40.00
No. 2 bundles	25.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	45.50

Cast Iron Grades

No. 1 cupola	*46.50*
Heavy breakable	*27.00-28.00†*
Foundry malleable	41.00
Unstripped motor blocks	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00†

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*25.00-26.00*
No. 2 heavy melting	*20.00-21.00*
No. 1 bundles	*25.00-26.00*
No. 1 busheling	*25.00-26.00*
Machine shop turnings	*7.00-8.00*
Short shovel turnings	*10.00-11.00*
No. 1 cast	*$3.00*
Mixed cupola cast	*$3.00*
No. 1 machinery cast	*$4.00*

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*20.00-21.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*32.00-33.00*
Machine shop turnings	13.00-14.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
Punchings & plate	*33.00-34.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	*34.00-35.00*
Charging box cast	*35.00-36.00*
Heavy breakable	*35.00-36.00*
Unstripped motor blocks	*19.00-20.00*
Clean auto cast	*48.00-49.00*

SEATTLE

No. 1 heavy melting	30.00†
No. 2 heavy melting	28.00†
No. 1 bundles	22.00†
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	34.00
No. 2 heavy melting	32.00
No. 1 bundles	30.00
No. 2 bundles	17.00
Machine shop turnings	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	46.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

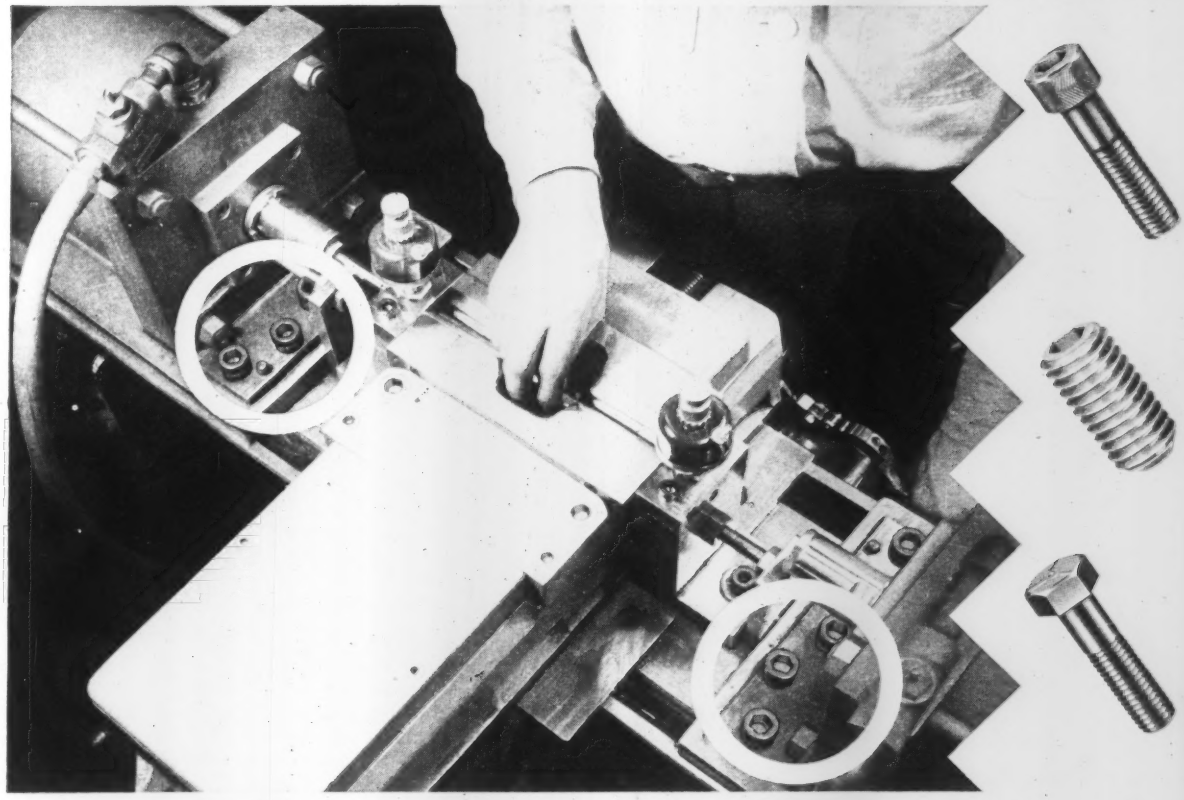
No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	39.00-41.00

*Brokers' buying prices.
†Nominal.
‡F.o.b. Hamilton, Ont.

IT PAYS TO STANDARDIZE ON **STANSCREW**



A 20-ton impact load . . . 14,400 times a day! Stanscrew Fasteners solve the problem

Fastening the air cylinders on this tube former is a real problem. Each of these 8" bore cylinders delivers a thrust of over 20 tons every time the machine is operated. And since this happens 14,400 times in a normal working day, ordinary fasteners would soon fail under these repeated shock loads. Furthermore, not even the slightest misalignment can be tolerated in this machine.

The Stanscrew fastener specialist was able to quickly answer this demanding problem. His solution was Stanscrew Socket Head Cap Screws, tightened to within 80% of yield strength so they remained in tension. These fasteners, so applied, deliver a clamping force that eliminates the shock feature of this extremely high loading . . . and provides a 100% factor of safety.

Tough assignments like this are everyday jobs for your Stanscrew fastener specialist. Immediately on call, through your Stanscrew distributor, he can bring to your problem years of specialized experience. And, back of him, is an outstanding staff of engineers who have been solving the fastener problems of American industry since 1872.

Stanscrew's complete line of more than 4,000 different types and sizes will provide economical answers to your fastener requirements. All 4,000 items are always in stock, quickly available.

Call your Stanscrew distributor today for solutions to your fastener problems. He will arrange a prompt meeting with the Stanscrew fastener specialist . . . who can often suggest ways to save you money by substituting standard fasteners for costly specials.

STANSCREW FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois

Copper Use Parallels Sales

Most deliveries have been for immediate consumption. Inventories, cut sharply in the past year, have risen only slightly. Outlook good, prices stable

Nonferrous Metal Prices, Pages 130 & 131

COPPER consumers have stepped up buying because their own sales are better, not from fear of a shortage or runaway price market.

• **The Proof**—A spot survey by STEEL of four major metalworking centers (New York, Pittsburgh, Cleveland, and Chicago) reveals little hedge buying and only slight inventory replenishment. That means copper's current position is even stronger than simple sales figures would indicate. It spells a high level of business for the industry in the weeks ahead.

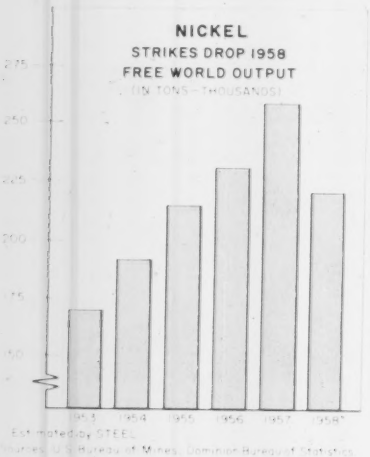
• **Boom** — Copper "consumption" (shipments of fabricated products by foundries and brass and wire mills) hit 138,916 tons in October, 33,442 tons over September and the best month since March, 1955. At the same time, unfilled orders on fabricators' books rose to a 17-month high and more new orders were received than in any month since January, 1956.

Big users are buying mostly for current consumption. There is some inventory buildup, but that generally reflects beter business.

• **Stocks Slashed**—Even so, inventories are down sharply from a year ago. Some cutbacks took place in the last six months but most came between September, 1957, and May of this year.

A copper distributor in Pittsburgh says the average inventory for its large accounts is no more than a week and that small customers have even less on hand. One indication: A year ago, users were satisfied with deliveries three to four weeks after placing orders. Now they "grudgingly" settle for a week to ten days and press for still faster deliveries.

• **Uncertainty** — A Pennsylvania company has attempted to increase inventories lately, but business has improved so steadily that every time the company orders copper for both consumption and inventory, it all finds its way into current usage.



One reason many consumers are worried about inventories: A year ago they found themselves with unwieldy stocks which led many to cut below "safe" working levels. The fourth quarter business upswing has been faster than many estimated and there are still enough foggy factors in the economy to make forecasts sketchy. That puts users in a two-pronged dilemma: How do you increase stock to "safe" levels without tying up funds in unneeded inventory?

• **Fair Weather Ahead**—Look for continued good business. One northern manufacturer which has become a heavy buyer expects to maintain its current rate for at least six months. Brass mill sales also are expected to show gains. There's more demand for tubular products from plumbing goods distributors. Distribution transformer business is picking up. Demand for magnet wire is on the upswing. Capital equipment sales are weak.

• **Outlook** — Automakers still haven't plunked both feet into the market. When they do, it will add impetus to copper's recovery (cars and trucks account for about 8 per cent of total consumption).

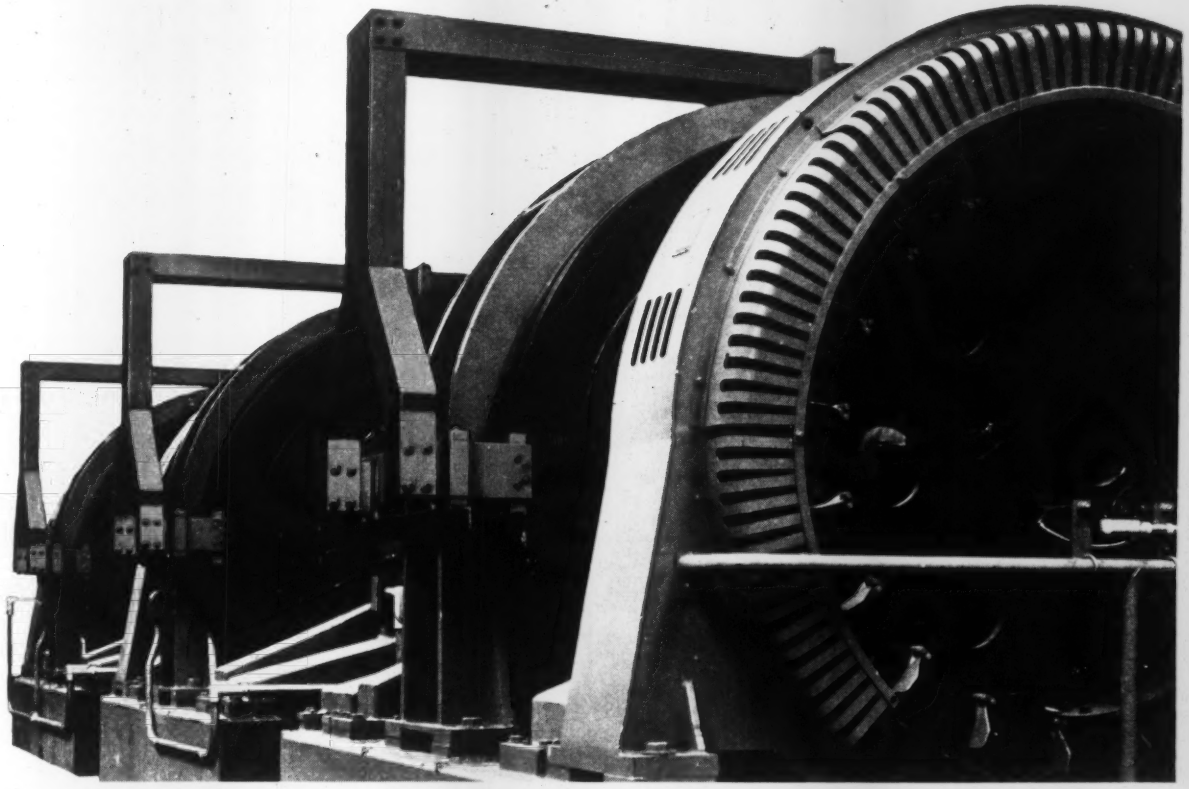
Look for some extra buying for inventory replenishment in the weeks ahead even though most sales will continue to be for current consumption. The primary price is stable. Custom smelters had dropped their price by 0.5 cent a pound by the middle of last week and were expected to go lower. Significance: Custom smelters had geared their price for overseas sales (where they could command a higher price), but this market collapsed last week. Lower European demand caused London Metal Exchange prices to fall, making it no longer profitable for custom smelters to ship there.

The custom smelter drop is a "technical correction" to make the price more competitive with primary. At 29.5 cents a pound custom smelters were still 0.5 cent over primary.

NONFERROUS PRICE RECORD

	Price Nov. 25	Last Change	Previous Price	Oct. Avg	Sept. Avg	Nov., 1957 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	29.00-29.50	Nov. 25, 1958	29.00-29.75	28.058	26.428	26.217
Lead	12.80	Oct. 14, 1958	12.30	12.473	10.730	13.300
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	99.375	Nov. 25, 1958	99.25	96.500	94.120	89.288
Zinc	11.50	Nov. 7, 1958	11.00	10.865	10.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



REVERE COPPER BUS BAR

used in two new 700-ft. long Udylite Bumper Plating Machines at

FORD MOTOR COMPANY

Aids in the production of a new, more durable, corrosion-resistant finish

Said to be the world's largest, the two Udylite plating machines are capable of turning out, per machine, 35 racks of bumpers an hour through 10 stages of a 3½ hour plating cycle. The electro-plating installation uses eighty generators, varying from 5,000 to 20,000 amps, which combined, provide enough power to light more than 150,000 bulbs of 100 watts each.

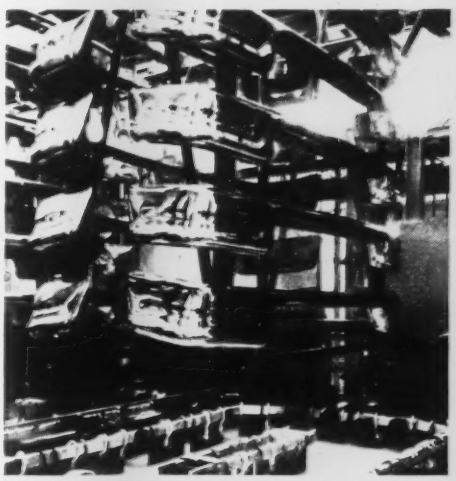
To carry that kind of a load from generator to plating machine, Revere Copper Bus Bar was used because of copper's superior electrical and heat conductivity. No other commercial metal of the same cross-section area approaches electrolytic copper in its ability to carry electricity, while its high thermal conductivity offers the greatest ease of cooling. This means a more compact installation with a resultant saving in space. Also, joints of high electrical conductivity are readily made by soldering, brazing or bolting. For information on Revere Bus Bar, as well as other Revere copper and brass mill products consult the nearest Revere Sales Office. You'll find it listed in the yellow pages of the telephone directory.

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Rome, N.Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N.Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities. Distributors Everywhere.



RACK OF BUMPERS ready for immersion into plating solution at Ford Motor Company's plant at Monroe, Michigan. New process uses copper, white brass, nickel and chromium which results in outstanding durability.

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.

Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 29.00 deld.; custom smelters, 28.50; Lake, 29.00 deld.; fire refined, 28.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $228-231 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for adition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $15-17 per troy oz.

Platinum: $52-55 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $15-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 90.125 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 99.375; prompt, 99.50.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max, 24.75-25.00; 13 alloy 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.25; grade 2, 22.00; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 28.00; tin bronze, No. 225, 37.50; No. 245, 32.25; high-leaded tin bronze, No. 305, 32.25; No. 1 yellow, No. 405, 23.00; manganese bronze, No. 421, 24.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.885, f.o.b., Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.865, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 34.35; l.c.l., 34.98. Weatherproof, 20,000-lb lots, 35.51; l.c.l., 36.29.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-10.50; forging billets, $3.80-4.35; hot-rolled and forged bars, $5.10-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-51.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-13.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017 T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	.....	.....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	.....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	.....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	.....	.....
2.250	53.50	52.10	.....	56.20
2.375	53.50	52.10	.....	.....
2.500	53.50	52.10	.....	56.20
2.625	.....	50.40	.....	.....
2.750	51.90	50.40	.....	56.20
2.875	.....	50.40	.....	.....
3.000	51.90	50.40	.....	56.20
3.125	.....	50.40	.....	.....
3.250	.....	50.40	.....	.....
3.375	.....	50.40	.....	.....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard lengths, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 169.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-.30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 22.00-23.00; No. 2 heavy copper and wire, 20.00-20.50; light copper, 18.00-18.50; No. 1 composition red brass, 16.50-17.00; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	SCRAP ALLOWANCES e (Based on copper at 29.00c) Clean Heavy	Rod Ends	Clean Turnings
Copper	52.13–53.13b	49.36–50.36c	....	52.39–53.39	25.000	25.000	24.250
Yellow Brass	45.57–46.57	30.22–31.22d	46.11–47.11	48.48–49.98	17.000	16.750	15.250
Low Brass, 80%	48.23–49.23	48.17–49.17	48.77–48.87	51.04–52.54	21.250	21.000	20.500
Red Brass, 85%	49.17–50.17	49.11–50.11	49.71–50.71	51.98–53.48	22.125	21.875	21.375
Com. Bronze, 90%	50.65–51.65	50.59–51.59	51.19–52.19	53.21–54.71	22.875	22.625	22.125
Manganese Bronze	53.44–54.98	47.64–48.58	58.08–59.08	....	17.750	17.500	16.875
Muntz Metal	47.85–49.35	43.66–44.66	....	....	17.875	17.625	17.125
Naval Brass	49.74–51.24	44.06–45.05	56.80–57.80	52.90–54.65	17.625	17.375	16.875
Silicon Bronze	56.77–58.27	55.96–57.46	56.81–57.81	62.13	24.625	24.625	23.625
Nickel Silver, 10%	60.70–62.20	63.03–66.60	63.03–64.03	....	23.875	23.626	11.937
Phos. Bronze	71.09–72.59	71.59–73.09	71.59–72.59	72.77	25.875	25.625	24.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 15.50-16.00; new brass clippings, 17.00-17.50; light brass, 11.00-11.50; heavy yellow brass, 12.00-12.50; new brass rod ends, 14.00-14.50; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.00-14.50; brass pipe, 14.00-14.50.

Lead: Heavy, 8.50-9.00; battery plates, 4.75-5.25; linotype and stereotype, 10.50-11.00; electrotype, 9.00-9.50; mixed babbitt, 9.50-10.00.

Monel: Clippings, 31.00-33.00; o'd sheets, 28.00-30.00; turnings, 22.00-24.00; rods, 31.00-33.00.

Nickel: Sheets and clips, 52.00-55.00; rolled anodes, 52.00-55.00; turnings, 37.00-40.00; rod ends, 52.00-55.00.

Zinc: Old zinc, 4.00-4.25; new diecast scrap, 3.75-4.00; old diecast scrap, 2.50-2.75.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.50-7.00; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 12.75-13.25; mixed high copper clips, 11.25-11.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.50-17.00; segregated high copper clips, 15.50-16.00; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.00-15.50.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 10.00-10.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 13.50-14.00; mixed low copper clips, 14.50-15.00; mixed high copper clips, 13.00-13.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 55.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 24.25; No. 2 heavy copper and wire, 23.25; light copper, 21.00; refinery brass (60% copper) per dry copper content, 22.75.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 24.25; No. 2 heavy copper and wire, 23.25; light copper, 21.00; No. 1 composition borings, 19.00; No. 1 composition solids, 19.50; heavy yellow brass solids, 13.50; yellow brass turnings, 12.50; radiators, 15.75.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45.

Copper: Flat-rolled, 45.79; oval, 44.00; 5000-10,000 lb; electrodeposited, 38.50; 2000-5000 lb lots; cast, 41.00; 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-1999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 117.50; 200-499 lb, 116.00; 500-999 lb, 115.50; 1000 lb or more, 115.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.65; 2000-5900 lb, 12.65; 6000-11,900 lb, 12.40; 12,000-22,900 lb, 12.15; 23,000 lb or more, 11.65.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 78.00; 100-600 lb, 68.80; 700-1900 lb, 66.00; 2000-9900 lb, 64.10; 10,000 lb or more, 62.80.

Stannous Chloride (anhydrous): 25 lb, 153.20; 100 lb, 148.30; 400 lb, 145.90; 800-19,900 lb, 105.00; 20,000 lb or more, 98.90.

Stannous Sulphate: Less than 50 lb, 138.40; 50 lb, 108.40; 100-1900 lb, 106.40; 2000 lb or more, 104.40.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 125*)

interest, except for bargain-priced material.

Los Angeles—Uncertainty rules in the scrap market here, with tonnage moving slowly from dealers' yards. Auto wrecking activity is at low ebb. Price buoyancy of cupola cast is noted, and some sellers are anticipating higher prices on that grade.

San Francisco—Dealers' hopes of an early resumption of scrap shipments to Japan have been dashed by the statement of a Japanese trade representative: His country probably won't buy any scrap from Pacific Coast sellers for several months. And he said that when shipments are resumed, they will be in smaller quantities.

Seattle — Little change is noted in the market, but there seems to be growing resistance to present price levels on the part of dealers. They seem convinced that the worst

MODERN OVERHEAD CRANES

Inspection Invited—Cranes In Actual Use

Capacity	Make	Span	Lift
150 Tons (2-75 T. Trolleys)	Shepard Niles	100′	39′
20 Tons (2-10 T. Trolleys)	Shepard Niles	98′ 10″	27′

These modern cranes have had little use and are in excellent-like new condition.

ALL CRANES 230 VOLTS D.C.
PRICED LOW FOR QUICK REMOVAL
Located Schenectady, New York
HERMAN H. SCHWARTZ CO.
P. O. Box 181 Rochester 10, N. Y. Phone LOcust 2-3215

METALLIZING WIRES
all ferrous and non-ferrous metals
Rigidly Specified for
Metal Spraying
Spra-Rod CORPORATION
2795 E. East 81st St. • Cleveland, Ohio • LOngacre 1-7168

GET CASH NOW
for your new surplus motors, controls and transformers!
AVAILABLE: NEW MOTORS
Over 5,000 new motors in stock, from ¼HP to 200 HP. Special low prices.
Write, wire or phone collect!
AJAX ELECTRIC MOTOR CORP.
P.O. Box 262, Rochester, N.Y.
Long Distance Phone LD. 132

EQUIPMENT WANTED
Multi-Spindle Drill to take a min. of 16—1⅛ drills. Upper joint min. 2½". Drive 30 to 50 HP. Preferred NATCO or BAUSH, Springfield, Mass.
W. S. ROCKWELL COMPANY
(Purchasing Dept.)
200 Eliot St. Fairfield, Conn.

FOR SALE
One Link Belt Positive Action, Oscillating Conveyor. Capacity 1 TPH. Trough Width —36". Overall length—30'. Allis Chalmers motor, total enclosed, fan cooled, 3 phase, 60 cycles, 220/240 volts, 5 horsepower. Practically new.
FEDERAL STEEL PRODUCTS CORP.
415 N. St. Charles St. Houston 3, Texas
Phone CApitol 2-6315

GRADUATE METALLURGIST WANTED
Graduate Metallurgist, not over 35, with degree in Metallurgy or Metallurgical Eng. Must have Ferrous background and several years experience, preferably in electric furnace shop producing rolled product. Duties primarily in production and development and will include test evaluation.
Reply Box 701, STEEL
Penton Bldg. Cleveland 13, Ohio

MANAGER WANTED
Wire rope manufacturing plant. Excellent opportunity for right man with plant managerial experience. Engineering background essential. Knowledge wire rope or steel wire manufacture valuable. Medium sized company. Replies in strict confidence. Send resume with background and qualifications and indicate salary desired.
Reply Box 710, STEEL,
Penton Bldg. Cleveland 13, Ohio

CLASSIFIED

Help Wanted

STRUCTURAL ENGINEER
Structural steel designer and estimator for industrial buildings and miscellaneous steel structures, as well as steel plate fabrication. Applicant should be graduate engineer, preferably 30-40 years old, with minimum of 5 years actual structural steel design experience. Permanent employment, paid vacations, group insurance plan. Excellent opportunity. Location Mid-Continent. Good Schools. Employer is nationally known, well established steel fabricator. Reply fully, giving resume of experience, education, age and salary requirements to Box 709, STEEL, Penton Building, Cleveland 13, Ohio.

Positions Wanted

SALES ENGINEER
Fifteen years experience, tool steel and stainless. New York, Connecticut and Eastern Pennsylvania territory preferred. Will furnish resume. Reply Box 707, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOR CLASSIFIED RATES
And Further information write
STEEL, Penton Bldg., Cleveland 13, O.

HAVE YOU TRIED THIS EXTRAORDINARY CLEANER?

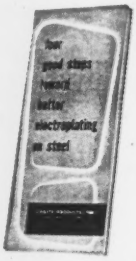
Oakite Rustripper removes rust and heat scale in the same operation that removes oil. It avoids hydrogen embrittlement, damage to machined surfaces and other disadvantages of acid pickling.

Have you taken the four good steps?

How can cleaning costs be reduced 33% while cleaning quality is being improved? *See pages 7 and 8 of booklet.*

What are four easy ways to improve the average rinse tank? *See page 10.*

What causes hydrogen embrittlement during electrocleaning? What is the remedy? *See pages 15 and 16.*



Do you need a brass cleaner that gives better protection against tarnishing?

Oakite has a new brass cleaner that provides scientific protection against the oxygen that tarnishes brass and other copper alloys during the application of reverse current.

"It cut our cleaning rejects by more than 90%"

says a manufacturer who found that Oakite Composition No. 95 gave him:

BRIGHTER PLATING—All films removed . . . no residues, no undersurface shadows, no anodic blackening, nothing to impair the brightness of the electroplate.

FEWER REJECTS—Major causes of blistering and peeling eliminated . . . Consistent success in baking for 60 minutes at 300°F.

OAKITE PRODUCTS, INC.
34E Rector Street, New York 6, N. Y.

Send me the FREE booklets indicated below:

- ☐ Here's the best shortcut in the field of electroplating
- ☐ Four good steps toward better electroplating on steel
- ☐ What's NEW for electrocleaning brass and other copper alloys
- ☐ Good news about electrocleaning zinc-base die castings

NAME _____

COMPANY _____

ADDRESS _____

FREE
For further information, ask for booklet

OAKITE.

Technical Service Representatives in Principal Cities of U.S. and Canada

is over and that improved demand can't be too far off. They are disposed to hold out for higher quotations. Yard receipts are light, and some yards are practically out of stocks.

Scrapmen Ask Removal of Waterborne Freight Fee

Scrapmen are seeking elimination of a $1.20 per ton charge recently granted on waterborne shipments of scrap.

The Institute of Scrap Iron & Steel Inc., Washington, has been joined in an action before the Interstate Commerce Commission by Summer & Co., Columbus, Ohio, and Luria Bros. & Co., Philadelphia.

Structural Shapes . . .

Structural Shape Prices, Page 112

Most structural steel fabricating shops are fairly active, but they are operating on a much narrower basis with their backlogs down sharply from those a few months ago. Stiff competition for new work is reflected in lower fabricated prices and a tendency of many shops to reach out beyond their normal territories for work.

New bridgework is holding up fairly well in New England, but tonnage required for jobs being estimated is smaller. Except for one plate girder project, in Connecticut, most spans are stringer and I-beam construction, which means less shop fabricating.

Distributors . . .

Prices, Page 119

Bookings by steel service centers are holding steady. The rate, which has been maintained for three months, is the highest of this year and about 20 per cent above the summer low. Some buying is for stock replacement.

Distributors are buying more actively from the mills to round out stocks in preparation for an expected pickup in business early next year. Prospects for the first quarter are bright.

The price situation has stabilized in the Seattle area. But in the surrounding territory, price cutting has created an unsatisfactory competitive situation.

Advertising Index

Abell-Howe Co. 105
Acme Chain Corporation 6
Adams, R. P., Co., Inc. 109
Ajax Electric Motor Corporation 131
Alco Products, Inc. 77
Allen-Bradley Co. 93, 94
Allmetal Screw Products Co., Inc. 123
American Roller Die Corporation 104
American Steel & Wire Division, United States Steel Corporation 14, 15
Armstrong-Blum Mfg. Co. 33
Aronson Machine Co. 16
Atlantic Refining Co. 11
Automotive Gear Division, Eaton Manufacturing Co. ..... Inside Front Cover
Avondale Marine Ways, Inc. 83

Baltimore & Ohio Railroad 45
Bethlehem Steel Co. 1
Borg-Warner Industrial Cranes 58
Buffalo Bolt Co., Division of Buffalo-Eclipse Corporation 98

Carpenter Steel Co., The 90, 91
Central Foundry Division, General Motors Corporation 22, 23
Chase Brass & Copper Co. 46
Clemson Bros., Inc. 17
Cleveland Hotel 133
Colorado Fuel & Iron Corporation, The 96, 97
Columbia-Geneva Steel Division, United States Steel Corporation 14, 15, 61
Crucible Steel Company of America 20, 21

Diamond Mfg. Co. 84

Eastman Kodak Co., X-ray Division 85
Eaton Manufacturing Co., Automotive Gear Division ..... Inside Front Cover

Fairfield Manufacturing Co. 95

General Motors Corporation, Central Foundry Division 22, 23

Harris Foundry & Machine Co. 100
Heresite & Chemical Co. 102
Hill Acme Co., The 24

Industrial Brownhoist Corporation 81
Inland Steel Co. 36
International Nickel Co., Inc., The 34

Johnson Bronze Co. 53
Jones & Laughlin Steel Corporation, Stainless & Strip Division 25, 26, 27, 28

Kardong Brothers, Inc. 124
Kidde, Walter, & Co., Inc. 10

Levinson Steel Co., The 117

Mallory-Sharon Metals Corporation 2
Mesta Machine Co. 79
Monarch Machine Tool Co., The 134

Niagara Blower Co. 56
Norton Co. 63

Oakite Products, Inc. 132

Pannier Corporation, The 123
Progressive Mfg. Co., The, Division of The Torrington Co. 124

Ransburg Electro-Coating Corporation 88
Reliance Electric & Engineering Co. ..... Inside Back Cover
Republic Steel Corporation 8, 9
Revere Copper & Brass, Inc. 129
Rockford Machine Tool Co. 18, 19
Ruemelin Mfg. Co. 109
Russell, Burdsall & Ward Bolt & Nut Co. 54
Ryerson, Joseph T., & Son, Inc. 30

Shepard Niles Crane & Hoist Corporation 29
Somers Brass Co., Inc. 57
Spra Rod Corporation 131
Standard Screw Co. 127
Stanley Steel Strapping, Division of The Stanley Works 13
Surface Combustion Corporation 106, 107

Tennessee Coal & Iron Division, United States Steel Corporation 14, 15, 61
Textile Machine Works, Contract Division 124
Timken Roller Bearing Co., The ..... Back Cover
Thompson, Henry G., & Son Co., The 64, 65
Torrington Co., The, The Progressive Mfg. Co. Division 124

United Engineering & Foundry Co. 99
United States Rubber Co., Mechanical Goods Division 50
United States Steel Corporation, Subsidiaries 14, 15, 61
United States Steel Export Co. 14, 15, 61
United States Steel Supply Division, United States Steel Corporation 61
Universal-Cyclops Steel Corporation 4

Verson Allsteel Press Co. 118

Ward Steel Co. 122
Warner & Swasey 3
Washington Steel Corporation 108
Whitehead Metal Products Co., Inc. 12
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 96, 97
Wisconsin Motor Corporation 122
Wyman-Gordon Co. 68

Youngstown Sheet & Tube Co., The 7

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 131

HOTEL CLEVELAND

Bronze Room

One of the brightest of the city's supper clubs. Dancing nightly from 9:00 p.m.
Air conditioned, of course.

Rib Room

A true specialty restaurant
For Fabulous Roast Beef, roasted, carved and served to your order

MEN'S BAR

Strictly stag — is this all male haven for good drinks, good food and good talk
Plus sports events on TV.

TRANSIT BAR

For rapid service in the most unique bar in the country decorated with an outstanding collection of miniature trains.

the PATIO

Pause — in the relaxing, informal atmosphere of the gayly decorated Patio. It's a Cleveland habit to say — "Meet me at the Patio."

Coffee Shop

Service is brisk and decor cheerful in the modern, air-conditioned coffee shop. Enjoy a tasty sandwich or a moderately priced meal.

HCA Hotel Cleveland
CLEVELAND, OHIO

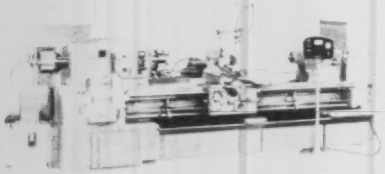
It's a breeze

TO CUT COSTS, BOOST PRODUCTION AND QUALITY WITH THE MONARCH "AIR-GAGE TRACER"

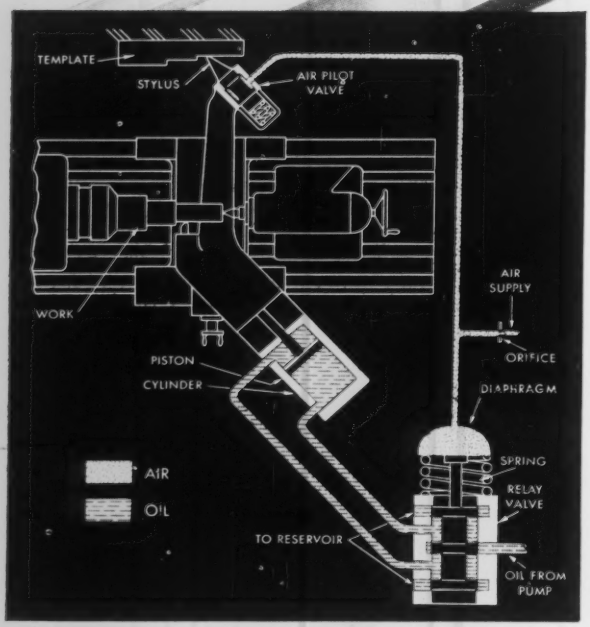
No lathe development in recent years has equaled template controlled turning for substantial cost reduction. Its advantages, when performed the Monarch "Air-Gage Tracer" way, are many. This duplicating method:

- Always outproduces a manually operated machine; in some instances as much as 8 to 10 times.
- Provides automatic sizing, thereby reducing spoiled work to the absolute minimum.
- Imparts a smooth, stepless finish on any combination of cuts, whether turning, facing or boring.
- Often halves amount of stock left for grinding; sometimes eliminates grinding and polishing operations.
- On most work, reproduces accuracy of template within ± .001".
- Eliminates the need for expensive form tools and the cost of multiple tool setups.
- Allows a complete setup change in as little as 15 to 20 minutes; tool change in 1 minute.

Write for complete descriptive booklet No. 2608. It contains dozens of typical job examples... ***The Monarch Machine Tool Company, Sidney, Ohio.***



Above is a Monarch Series 62 Preselector Dyna-Shift Lathe with "Air-Gage Tracer" and auto cycle unit. This duplicating means may be factory applied to all Monarch lathes.



This diagrammatic drawing shows simplicity of "Air-Gage Tracer" operation. Note that design deals with both air and oil in constant motion. Result—super-accuracy piece after piece, job after job.

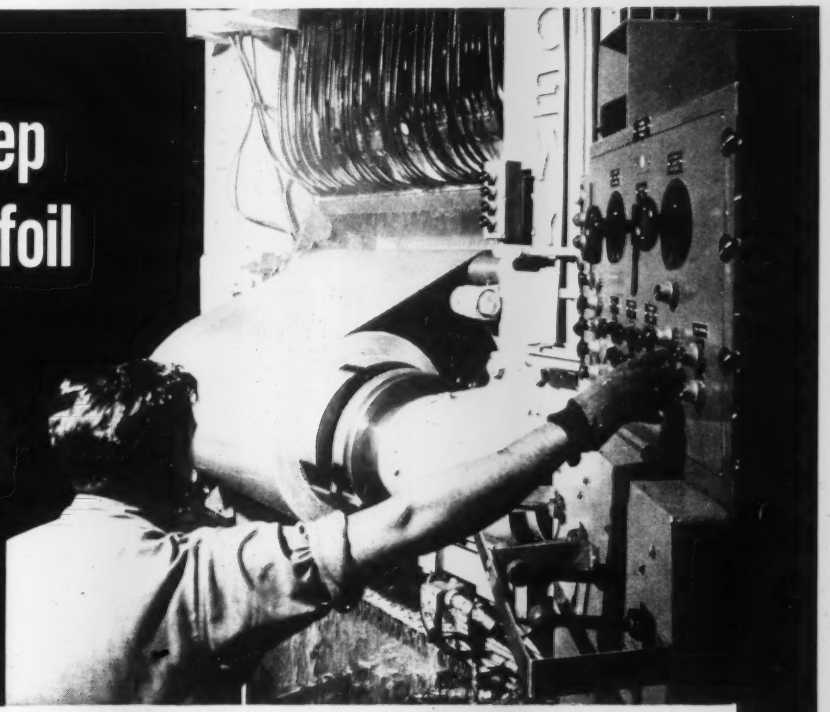
Exclusive Features of the "Air-Gage Tracer"

1. The only lathe duplicator which utilizes the combination of air-hydraulic control. That's the secret of its super-accuracy.
2. The air circuit is an open loop servo system which provides air-gaging and multiplies both force and motion.
3. It's the simplest and most trouble-free of all lathe duplicating methods. Tracer head maintenance is never a costly problem.
4. Stylus pressure against template is only 5 to 6 ounces, practically eliminating template wear.
5. Either a flat or a round template may be used. Never is it necessary to use a large, bulky round template so that it can be indexed periodically due to excessive wear from high stylus pressure.
6. Available both in a rigid and swiveling type, the latter of which may be used at any setting between 45° and 90°. Universal nature of swiveling type a "must" for top production on many complex facing and boring operations.
7. The only lathe duplicator offered optionally with full automatic cycling and potentiometer feed control.

Monarch
TURNING MACHINES
FOR A GOOD TURN FASTER TURN TO MONARCH

how to keep aluminum foil from shattering

... at 35 miles per hour!



Kaiser Aluminum & Chemical Corp. increased annual production of aluminum foil 50% at its Permanente, California plant through installation of a four high foil mill. This mill reduces aluminum strip in thickness from .026 to .00025 of an inch at speeds up to 3000 fpm.

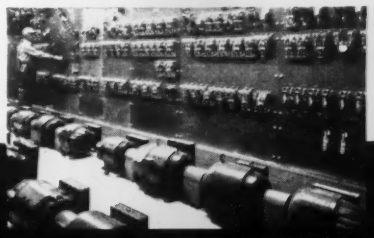
At 35 miles per hour, excessive strain at any of the several reduction stages would shatter the extremely thin foil. From the original payoff reel through to the final rewind, uniform tension is provided by Reliance V★S Drives.

Reliance engineers designed this drive specifically for this mill, to provide the constant uniform tension which is so important.

This application is typical of the many diversified jobs that Reliance V★S Drives are called upon to perform. There is a Reliance V★S Drive to fit your application.

D-1862

For further details, write Dept. 412A, or call!

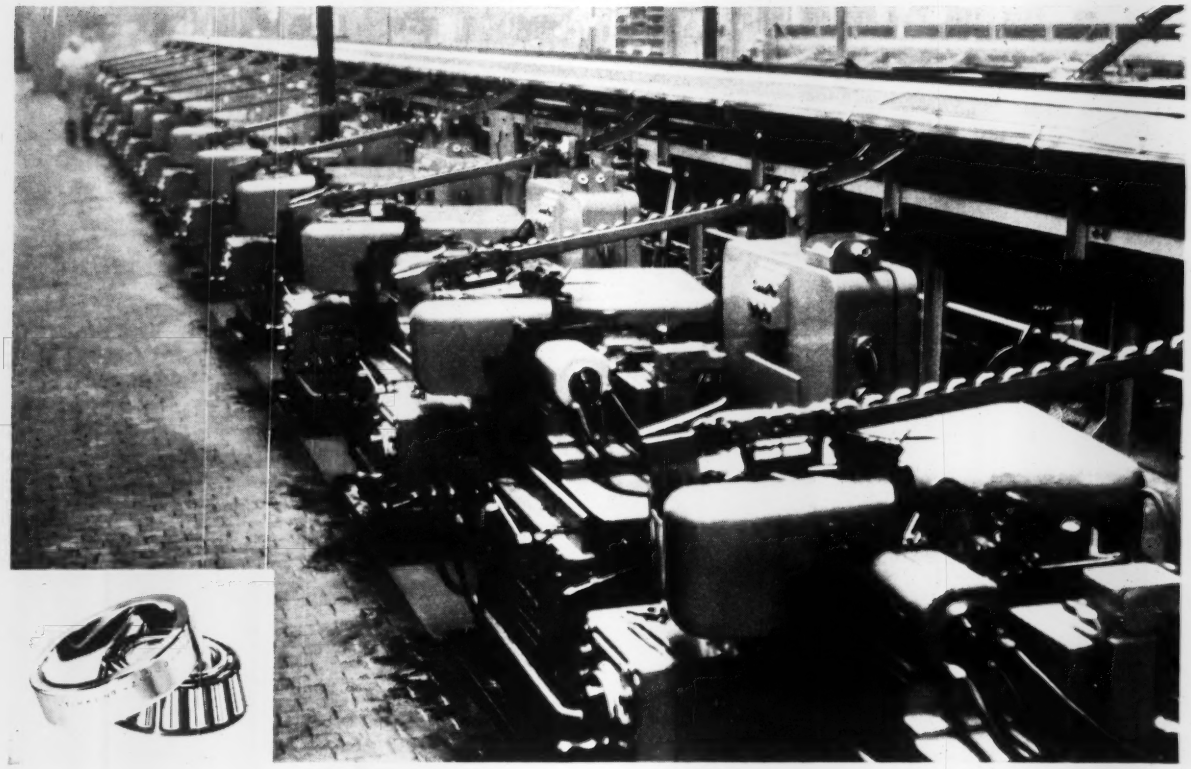


Main control room—Where Reliance equipment provides more than 2,900 hp. to drive this mill.

RELIANCE ELECTRIC AND ENGINEERING CO.

CLEVELAND 17, OHIO • CANADIAN DIVISION: WELLAND, ONT.

Sales Offices and Distributors in Principal Cities



How missile-age bearing production can cut your bearing costs

HERE'S the inside of our revolutionary new bearing plant in Bucyrus, Ohio that can turn out a record-shattering 30 million bearings a year without a hand touching them. By standardizing on bearings, made by these ultra-modern methods, the automobile industry has helped keep these fantastic machines going, helping us make bearings at lower cost so we can pass the manufacturing savings on to our customers.

Why not cut your bearing costs by switching to cost-cutting Timken® bearings made by the ultimate in mechanization? Our engineers will be glad to help you adapt them to your machines. If you've already made the switch as the farm implement and conveyor manufacturers have—use more *Timken* bearings and keep on saving. The chart at right shows the bearing sizes and numbers made in Bucyrus, to use for savings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN TAPERED ROLLER BEARINGS PRODUCED AT REVOLUTIONARY BUCYRUS PLANT

CONE	CUP	BORE RANGE	O.D.	RATING @ 500 RPM	
				RADIAL	THRUST
*	2720	1.3125 1.625	3.0000	2720	1620
*	2729	1.3125 1.625	3.0000	2720	1620
*	3720	1.5625 2.062	3.6875	3700	2660
*	3920	2.0000 2.625	3.8375	3700	1760
LM11949	LM11910	7.500	1.781	885	70
M12649	M12610	6.637	1.9687	1230	670
25580	25520	1.7500	1.250	2410	1910
25590	25523	1.7660	1.250	2410	1910
25877	25821	1.3750	2.8750	2400	1330
M86136	LM86110	1.3750	2.5625	1610	1190
LM67138	LM67010	1.2500	2.3268	1150	930
M88136	M88010	1.3125	2.6875	2000	2150
HM89243	HM89410	1.3125	3.0000	3070	3300
HM89246	HM89410	1.3750	3.0000	3070	3300
HM89249	HM89410	1.4375	3.0000	3070	3300
LM501349	LM501310	1.6250	2.6910	1910	1570
LM67739	LM67011	1.7812	3.0625	1990	1670

* Two cones in these series produced at Bucyrus plant

TIMKEN

TRADE-MARKS REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD